The Canadian
Medical Association Journal

Vol. VI. AUGUST, 1916 No. 8

THE TREATMENT OF DIABETES MELLITUS

By Elliott P. Joslin, M.D.

Boston

RATHER more success is achieved by surgeons in the treatment of general peritonitis than is attained by physicians in the treatment of diabetic coma. In neither condition are the statistics flattering to the profession; but the successes obtained by our surgical colleagues in the prevention of general peritonitis make the failure to prevent coma as a cause of two out of every three diabetic deaths mortifying to say the least. We physicians should begin to regard diabetic coma in the same light as your British brother, Mr. Moynihan, has taught the medical fraternity to look upon the late stages of a neglected gastric ulcer—namely, as an emergency which should not have been allowed to arise.

With this issue of the prevention of diabetic coma plainly to the fore as the cardinal point in the treatment of diabetes, it is pertinent to inquire what diabetic patients are most susceptible to coma? And your own experience will enable you to anticipate that the answer, which an analysis of my own fatal cases shows, will be children. Of the sixty-two diabetic children under the age of fifteen who have died under my care, coma was the cause of death in all, and the significance of this melancholy fact is this: that where diabetes appears in its most severe type, as in children, coma is its expression. The propositions are simpler to state than to execute —first, that the best way to avoid coma is to prevent the progress of a case of diabetes from the mild into the severe type, and second, to protect the patient from all those agencies such as infections, anæsthetics like chloroform and ether, undue exertion (mental or physical), which tend toward intensifying the severity of the dis-

Address delivered before the Ontario Medical Association, June, 1916.

ease. For if the diabetes is kept mild or moderate the coma need not be feared.

Next to the children in the frequency of death from coma, strange as it may appear, were those of my cases who succumbed during the first year of the disease. The cause of death in 87 per cent. of these was coma. But diabetes is a chronic disease and the first year of its course should be mild rather than severe, and in mild diabetes coma should find no place.

Just as the health officials of a city, zealous to lower its death rate, concentrate their efforts on those sections of the city with the highest mortality, so should we, in the treatment of diabetes, concentrate our efforts where mortality is also greatest—on the children and on those patients who have recently developed the disease. To-night attention will be directed upon the treatment following immediately upon the detection of the disease, for this is where the highest mortality in diabetes now exists.

Reference has just been made to a mortality of 87 per cent. from coma among diabetics who die during the first year of the disease. Is the term "first year of the disease" quite accurate? It is meant to be accurate. I have most conscientiously tried to fix a definite date for the onset of diabetes in all of my cases. But honestly would it not be more truthful to say the first year of the recognition of the disease? And herein lies a vast difference which gives rise to serious reflection, for it is in the first year of the *recognition* of the disease that treatment is begun, and the highest mortality occurs. Disagreeable as such an implication is to hear, some support for it is afforded by the fact that with the increase in the knowledge of the treatment of diabetes, the mortality for the first year of the disease has decreased. It is significant that whereas between the years 1824-1898, of those cases of diabetes dying at the Massachusetts General Hospital, the duration of the disease was under one year in 68 per cent., for the subsequent fifteen years ending November, 1913, Dr. Brigham and I are able to say, thanks to the courtesy of the hospital authorities, that the mortality during the first year of the disease had fallen to 41 per cent. My friend Professor Naunyn, whom all of you will recognize as a master of diabetes, though his cases must have been treated during a generation previous to ten years ago, showed a mortality of only 28·2 per cent., which was the same, as far as I can determine, for the city of Boston for 1915. The period of my own activity has been later, and so more favourable; perhaps my cases have been less severe, and this may explain first, why but 17 per cent. of my own cases

have died during the first year of the disease, and second, the more encouraging feature that 95 per cent. of those living have already gone beyond this period. In fact, my own experience is against the idea that properly treated diabetes runs an acute course. Such figures, while they afford reason for gratification at the improvement in treatment, also furnish proof that the high mortality in the first year is unnecessary, and in what follows will be indicated how the development of acid poisoning during this period may be avoided and how to conquer it before coma results.

The prophylactic and etiological treatment of diabetes will surely play an important rôle in the future, and it is already plain that progress will be along two lines; first, towards the early detection of the disease in those susceptible to it. The whole trend of Naunyn's teaching favours the energetic treatment of the slightest evidence of diabetes. The importance of the early treatment of pulmonary tuberculosis is not greater than that of the early treatment of diabetes.

The only way in which an early diagnosis of diabetes will ever be made is to search for it. The favourable results in fifty-seven of my cases of diabetes revealed by life insurance examinations cannot be explained by the mildness of the diabetes discovered. It is a hopeful sign that the insurance companies are offering to examine the urines of their policy holders gratis at frequent intervals. Everyone should have the urine examined upon his birthday.

Diabetes should be sought in the families of diabetic patients and in order to allay anxiety from urinary examinations, it is a good plan to have these made with such frequency that they will become simply a matter of routine. Such individuals should be taught to regulate the quantity of food eaten by the body weight, and never to indulge in unusual quantities of carbohydrate.

No preëxistent abnormal condition has occurred more frequently among my diabetic patients than has obesity, and it affords a splendid opportunity for the physician in which to practise preventive medicine. Patients should be cautioned against suddenly gaining weight at any period, but particularly after infectious diseases. The development of diabetes following infectious diseases and in the course of pregnancy always should be borne in mind. Finally, anything which tends to promote the mental and physical welfare of the patients will tend to prevent the onset of diabetes.

Surgery may find a field for treatment in the future more than it has in the past. I recall eight cases of diabetes associated with gall stones which ran an unusually favourable course so soon as

the symptoms of the gall stones had subsided, either as a result of medical or of surgical treatment.

That temporary periods of under-nutrition are helpful in the treatment of diabetes will probably be acknowledged by all after these two years of experience with fasting. In no other way can one so readily keep the urine free from sugar and this is the foundation of all diabetic treatment. With a sugar-free urine there is seldom any opportunity for coma. The inauguration of the treatment and the prolonged continuance of the same are problems which present the most difficulty. Practically the only danger associated with the former is the possibility of acid poisoning at the beginning of the fast, though it can be emphatically stated that it is the rule for acid poisoning to decrease rather than to increase as the fast continues. But on account of the few cases where it does increase it is safer to prevent acidosis than to allow it to develop. This is the reason for what might be called a preparatory treatment for fasting, for it can be assumed that a method of treatment which approaches or embraces fasting is the best method we possess. It is a sound rule of all treatment that patients coming to the physician in an endurable state must not be made worse or have their lives jeopardized by the therapeutic procedures adopted.

Treatment is simplified, if acidosis is prevented, because no urinary tests will, as a rule, be required save a qualitative test for sugar and the simple ferric chloride reaction for di-acetic acid. Such simplification of methods is necessary when we realize that most physicians do not have more than five or ten cases of diabetes a year and therefore cannot devote to these a proportionately large share of their time.

Individuals predisposed to acidosis are those in whom the disease is of long duration. These are the patients who, after having lived in a fairly comfortable condition for years, finally succumb to active treatment within a few days of its commencement. All complicated cases, especially those in which the complication involves the kidneys, heart or thyroid, demand preparatory treatment, for they are especially susceptible to acidosis. In this group are also included elderly patients, because of their vulnerable kidneys. Very fat diabetics could appropriately be included, and so too, patients about to undergo surgical operations. Finally, all patients showing signs of acid poisoning demand this preparatory treatment before the fast, unless the physician is in a position to watch quantitative changes in the acidosis from day to day.

The principle upon which preparatory treatment is based is

simplicity itself—the exclusion of the source of the acid poisoning. Since the chief source of acid poisoning is fat, this constituent of the diet is prohibited before any further change is made. If this rule is adopted, the opportunity for the patient to develop acid poisoning is greatly reduced, and for two reasons: first, the chief source of acid bodies is removed, and no fat is then available for the formation of acid bodies except the fat of the body; second, in consequence of the partial fast, which is thereby initiated, the possibility of oxidation of some of the carbohydrate which the patient is eating is afforded, and if this should fortunately take place, acidosis is sure to decrease. So strongly have I been impressed by the stormy career of the diabetic patients in whose diet carbohydrates have been suddenly restricted and fat increased, in contrast to the placid course which those pursue from whose diet fat has been excluded and the carbohydrates left unchanged, that whenever I am asked to see a new case of diabetes I beg the physician either not to change the diet at all, or simply to omit the fat until the consultation takes place, and when the patient actually comes for treatment I first omit all the fat in the diet, after two days the protein as well, and then halve the carbohydrate on successive days until 10 grams are reached unless the patient is already sugar-free, and thereafter fast.

The days of preparation for the fasting are also advantageous in that they allow opportunity to examine into the general condition of the patient. It would be absurd to feed a patient without teeth with course vegetables, or to give these to another patient who has diarrhœa. The bowels must be thoroughly opened, but I do not believe in free catharsis. Gain enough is obtained if a movement is produced once in twenty-four hours when it has only been taking place once in three days. In other words, do not upset any patient who is in a tolerable state. Furthermore, allow the patient to continue his regular routine, avoiding excess in any direction. Remember what happens to an old man who is suddenly confined to bed, and the discomfort which follows confinement following a fracture. Do not force a temperate man to drink against his will.

An advantage which the omission of fat from the diet affords is the rest which is given to the digestive tract. Former treatment, which increased the fat in the diet, was the converse of this, and frequently led to vomiting, with the result that patients on the verge of coma fell into it. In every way seek to prevent worry on the patient's part, and from the start give them to understand that they are at school rather than at a hospital.

After the preliminary measures have been taken to prevent the appearance of acidosis one may proceed with fasting. Fasting is never so rigourous as doctors or patients expect. Patients are more ready to undergo it than physicians to prescribe it. Quite as often it is as much a relief to the patient as it is a discomfort. This is in part due to the gradual decrease in polydipsia and polyuria. Headache occurs less frequently than I expected, and is usually dispelled by a cup of coffee. Nausea almost never occurs unless a patient is given alkali or alcohol. Children bear it more easily than adults. Case No. 899 with onset at eighty-three shunned it and rightly, but she became sugar-free and her family, at first reluctantly, but now emphatically, agree, with distinct benefit. In fact, it is always desirable to avoid fasting in the old, and this can ordinarily be accomplished by the help of preparatory treatment because the simple omission of fat and reduction of protein and carbohydrate will usually suffice to make the urine sugar-free.

Fasting does not seem like fasting to the patients when they receive coffee, tea, cracked cocoa and broths, and are given an unlimited supply of water. If the quantity of urine, as it often does, falls to less than normal, the patients are urged to drink water freely. Clear meat broths are a great satisfaction. Contrary to my experience with digestive cases, broths do not stimulate the appetite in fasting diabetics; they relieve it. The advantage of broths is probably due in part to this, but to a considerable extent to the patient receiving salt by which he may maintain the equilibrium of the body fluid. It is possible that the salt is a more important factor in the treatment than has been supposed.

Patients should not be kept abed during fasting, neither should they be forced to be up all day. They should be afforded diversion by visits from friends, walking short distances, easy handiwork, playing games, letter writing and reading. In general they are glad to rest for the greater part of the first day of the fast, but upon each succeeding day I have noticed that they are desirious to increase the amount of exercise, and the exercise appears to lessen the necessity for a prolonged fast. Case No. 765, a trained diabetic, who returned to the hospital in order to become sugar and acid-free, at the end of three and one-half days of fasting, enjoyed, without fatigue, going to the theatre. I confess this was not with my advice, for I have endeavoured to prevent exposure to any infectious disease of all diabetic patients during fasting. However, Case No. 938, a child of two and a half years, underwent fasting

treatment successfully in the presence of a mild infection of the upper air passages.

It is surprising how variable is the period required to render the urine sugar-free. Frequently a urine which contains 7 per cent. of sugar becomes sugar-free after four meals of fasting, and conversely a urine with only 3 per cent. of sugar may still retain traces after the patient has been deprived of food for three or four days. In general cases seen soon after onset become sugar-free promptly, whereas the reverse is generally true for those of long duration. Children showing large quantities of sugar have also become sugar-free very promptly when the duration has been only a few weeks. I have a suspicion that cases of long standing will actually become sugar-free more quickly if they undergo preparatory treatment than if they are fasted immediately. This may be due to the avoidance of even a slight acidosis. Even a slight acidosis must be conquered.

The observation of Folin and Denis that an obese individual, though otherwise normal, developed marked acidosis upon fasting but went through a second period of fasting with less acidosis than the first, and the practice, observed by many clinicians of the old school, who advantageously fasted their diabetics one day a week, have given the cue to intermittent fasting.

For a good many months none of my patients have been subjected to a fast of more than four days. A prolonged fast is unnecessary, and even if the fast is carried out, it is doubtful if the patient would always become sugar-free. The apparent reason for the persistence of sugar in Case No. 610, who fasted for nine days, was the presence of a vulval abscess, and inquiry among my friends shows that an infection of some kind is usually present when glycosuria persists after a fast of a few days' duration. This is not always the case, for the difficulty in rendering the urine sugar-free may be due simply to the extreme severity of the disease.

Alternate feeding and fasting are adopted when it is found that the glycosuria persists after a preliminary four days' fast. The method which I have found most successful has been to allow, following the first fasting period, 20 to 40 grams carbohydrate—not far from half a gram per kilogram body weight—and about one gram of protein per kilogram for two days. The sugar promptly increases in the urine, but if one averages the excretion of sugar in the urine of these two days with the two days at the beginning of the fast, the result is encouraging. Then fast again; but the second fast is a day shorter than the first, and the second period of feeding

a day longer, until by the fourth period of fasting the patient goes without food only one day and then is given food for four days. This schedule need not be followed exactly, but the general plan has proved most efficacious.

When the 24-hour quantity of urine is sugar-free one can usually give a few grams of carbohydrate to the patient without the appearance of glycosuria. The carbohydrate is generally given in the form of 5 per cent. vegetables, choosing those which are especially bulky. A plateful of lettuce appeals much more to the patient than a small saucer of string beans. When a mixture of 5 per cent. vegetables is given one can be quite sure that the average content of carbohydrate is not more than 3 per cent., or approximately $4\frac{1}{2}$ grams for the 150 grams prescribed, and for convenience sake this is reckoned as one gram of carbohydrate for each 30 grams (one ounce). This small amount of food, of course, has little nutritive value, but is enough to break the fast. Upon succeeding days 5 or 10 grams of carbohydrate are added daily. A patient fasting or on a very low diet often shows an apparent tolerance for carbohydrate far in excess of that which he would have shown if the necessary protein and fat in his diet were simultaneously administered.

Following the trial with 5 per cent. vegetables the addition of carbohydrate can be made according to the desire of the patient until the tolerance is determined.

With children one often makes the mistake of increasing the carbohydrate 5 grams daily, forgetting the fact that 5 grams of carbohydrate to a child weighing 20 kilograms is in the same proportion as 15 grams of carbohydrate to an individual of 60 kilograms.

Patients who have lived for a considerable length of time on a comparatively low tolerance for carbohydrate may upon trial show that the real carbohydrate tolerance is much greater than supposed. The most striking example in my series has been the patient already referred to—No. 610, who fasted for nine days without becoming sugar-free. During the last twelve months she has lived comfortably but the quantity of carbohydrate in the diet has been represented by 60 c.c. of cream (2 grams) for all her vegetables have been thrice washed. Despire this rigid diet sugar kept recurring every few days but she persisted to drive it out by fasting. Recently upon reëntrance to the hospital she became sugar-free overnight, and thereafter the steady addition of 10 grams of carbohydrate a day in the form of vegetables up to 55 grams,

failed to cause glycosuria, to the surprise of us all. At length, as a test, she drank 55 grams of lævulose and even then the urine remained sugar-free. At this time the protein in the diet was represented only by that contained in the vegetables. Thereafter it was gradually increased, and along with it a little fat, so that finally, at the end of ten days following her readmission to the hospital, she was taking 55 grams of carbohydrate, a gram of protein per kilo, and at this writing sufficient fat to be equivalent to about 25 calories per kilogram body weight. Contast this picture with that of a year ago when it was necessary for her to fast nine days to make the urine sugar-free and when a diet in excess of 2 grams of carbohydrate led to the appearance of sugar in the urine. This very recent experience has given renewed hope to my patients who have been watching its development, and to me. It is a fresh demonstration of the efficacy of energetic treatment.

As a rule when the urine has been sugar-free for two days, 20 grams of protein are added to the diet, and thereafter 15 grams of protein daily until the patient is receiving 1 gram per kilogram body weight. The protein may be given either in the form of eggs, lean meat or fish; an egg of average size contains approximately 8 grams of protein and 30 grams (1 ounce) of lean meat contain approximately 8 grams. By this arrangement a patient weighing 60 kilograms would be taking, within six days from the time he became sugar-free, 1 gram of protein per kilogram body weight. This quantity is quite satisfying to all except children—in fact, it astonishes me to find how few patients care to take as much as a gram and a half of protein per kilo body weight. Children, however, crave and need considerably more, and indeed take with avidity as much as 2 or 3 grams protein per kilogram body weight.

Fish is especially desirable in the early days of protein feeding because it contains so little fat. Cod and haddock, for example, contain less than 1 per cent.

The advantage of giving and increasing protein simultaneously with the determination of the carbohydrate tolerance is that one approaches more nearly normal conditions. What the physician is after is to determine the carbohydrate tolerance while the patient is on a full diet, and not the tolerance for carbohydrate alone, but it is possible that one should defer the addition of protein a few days longer if the carbohydrate can be steadily increased without the appearance of sugar.

There are very few patients who will not bear at the outset as much as 1 gram of protein per kilogram body weight, and I am

very loath to allow the protein to remain permanently below this figure. This can be avoided by still further restricting the carbohydrate, either temporarily or permanently. It is always necessary to bear in mind that one food which the diabetic patient cannot do without is protein, and to it everything else must be subservient.

While testing the protein tolerance, a small quantity of fat is included in the eggs and meat given. It is not at all disadvantageous—in fact, the same rule holds for the testing of the carbohydrate and protein tolerance in the presence of fat as has been said for protein alone. There are two important reasons why fat is not given to the diabetic immediately upon his becoming sugar-free: first, by the omission of fat partial fasting is continued and thereby the patient is gaining a tolerance for carbohydrate, and second, the continued omission of fat is beneficial in counteracting the last vestige of acid poisoning, or preventing the appearance of acid poisoning, which easily might occur in a diabetic patient whose metabolism has not become accustomed to so low a quantity of carbohydrate. But so soon as the patient has received the essential gram protein per kilogram body weight, the fat in the diet should be increased above the 15 to 20 grams which undoubtedly are introduced with the protein ration. If the patient is one in whom acidosis has been an essential factor, or if the patient is obese, the fat should be increased slowly, and for such a patient an increase of 5 to 10 grams a day may be all that he can take without the recurrence of a positive ferric chloride reaction in the urine. On the other hand, attention is called to Case No. 765, who, after persistent periods of intermittent fasting, became sugar and acid-free, and yet the immediate addition of 30 grams fat per day failed to cause the reappearance of acidosis. Cases which have shown little acidosis may easily be allowed an increase of 25 grams fat faily, and for such cases this is desirable, because it rapidly brings the total caloric value of the diet up to a normal figure. Naturally, patients in whose treatment a loss of weight is desired would be given smaller quantities of fat.

The total number of calories which a diabetic requires varies not only with each case, but varies with each case each day. Schematic rules do not hold. One must remember that an individual trained to be quiet and lying down can get along with only 20 calories per kilogram body weight reckoned per twenty-four hours, whereas the average of a large group of normal men and women, not especially trained for the test at the Carnegie Laboratory, consumed 25 calories per kilogram body weight reckoned also

per twenty-four hours. Habits of individuals vary widely. Some are quiet and some are active. All these considerations should be clearly borne in mind by doctors and patients in order not to allow themselves to be held too rigidly by any caloric fetish. Patients coming for treatment with severe acidosis consume from 10 per cent. to 20 per cent. more calories per kilogram body weight than patients after they have become sugar-free and free from acid.

After the diabetic has become sugar and acid-free, he apparently gets along, as Naunyn long ago pointed out, with a smaller amount of food than an ordinary individual. This may be so. From a study of dietary charts in diabetes it appears probable, but I do not believe the question yet settled. Before this can be done, studies should be made upon cases of diabetes of the severest type who have become sugar and acid-free, and remained so for a period of weeks. The caloric values of their diets should then be quantitatively determined. Ordinary calculations, based on dietary tables, will not suffice. Actual analyses of the diets of a group of such patients for a period of several weeks should be made. This is by no means an impracticable matter, and I think the accomplishment of it would be of the greatest help to diabetic patients and would settle many mooted points.

Should the calories be raised above a minimum portion in severe cases of diabetes, glycosuria will return. Therefore great care must be taken to prevent over-eating and undue gain of weight.

The return of sugar demands fasting for twenty-four hours, or until sugar-free. This rule should be inflexibly followed, especially with children. In hospital it simplifies the treatment enormously. So soon as it is understood that the reappearance of sugar means a fast for twenty-four hours thereafter, there is little tendency to break over the diet. Furthermore, most patients are thrifty enough to see the disadvantage of paying their board with no return. The rule must be rigidly enforced with children, because with them disobedience means death. When a patient has been made sugar-free by a preliminary fast, starvation for twenty-four hours will almost invariably be sufficient to free the urine at once if the sugar returns. This will not be the case unless the presence of glucose is promptly detected, and hence the necessity for the patient's examining his twenty-four hour urine daily. Following this accessory fasting day, the previous diet of the patient may at once be resumed except for the elimination of half of the carbohydrate, or the original course of treatment may be followed, except passing through the different stages at a more rapid rate.

The advantage which the older clinician derived from the use of one day's fast in seven in the treatment of his diabetic patients should ever be borne in mind. One striking characteristic of Dr. Allen's helpful suggestions in the treatment of diabetes (and I cannot say more than I already have said elsewhere of my high appreciation of his work) has been that he has apparently sought out every method which anyone has found useful in the treatment of diabetes, tested its worth, and endeavoured to adapt it to modern conditions.

The mild case of diabetes is the case which demands the most energetic treatment, but hitherto has received the least. These cases are analogous to the cases of incipient tuberculosis. As in tuberculosis, a cure may not be effected, but the disease is held in check. Emphasis should be placed on freedom from glycosuria. Naunyn's dictum that many a severe case was originally mild, but neglected, should not be forgotten. It may not be necessary for such patients to practise fasting. In our enthusiasm for new methods it should not be forgotten that even in the past good results were obtained with many diabetics, and that gradual restriction of carbohydrate and the total diet was the means employed. Incidentally, this is good proof that most diabetics are not severe.

It would be wrong to give the impression that the treatment of severe diabetes is simple and free from anxiety. It is true that it is much easier and causes infinitely less worry to the physician than heretofore, but these patients are in most unstable equilibrium and a little upset of trivial character may lead to much danger. The physician who treats severe diabetes successfully must constantly be in close touch with his patient. Forewarned, forearmed! I like to have at least a glance at a severe case of diabetes two, three or four times a day, and the amount of information furnished by the laboratory is never too great.*

---

* This paper was prepared simultaneously with the text of a book of similar title now being published for the author by Messrs. Lee & Febiger.

THE COLLOIDAL GOLD TEST IN CEREBRO SPINAL FLUIDS

By G. A. Ramsay, M.D.

Instructor in Pathology

AND

Edward Fidlar

Chief, Division of Pathology, Institute of Public Health, London, Canada

THE object of this article is to state our experiences and conclusions with the title subject. While further work leading out of this study has been interrupted, it has seemed advisable to give such results as we have obtained.

The published work upon this test is for the most part favourable, but the earlier hopes that it would serve to detect different types of syphilis of the central nervous system and different types of meningitis are not being realized.

In the following table is summarized the results of the examination of one hundred and eight specimens of spinal fluid. The cases are grouped according to the clinical diagnosis. No other tests have been made to parallel the colloidal gold test throughout the series, but the Wassermann test has been made in over 60 per cent. of the cases and has been noted. In the tabulation of our results we have expressed the curve of colour change after the manner of Lee and Hinton[2] thus: No change=0; slight change=1; red blue=2; violet=3; blue water=4; water clear (complete precipitation)=5. In this way the result appears as a series of ten numbers representing the degree of colour change in the ten tubes of the test, beginning with the 1:10 dilution and ending with the 1:5120 dilution. In the larger groups of cases to avoid listing a long series of numbers, we have determined roughly what might be termed an average and a mode formula, the former representing the approximate average change of colour in each tube, and the latter the series of colour changes to which the majority of the cases conform.

Received for publication May 29th, 1916.

Clinical Diagnosis	No. of Cases	Wassermann Test			Reading of Individual Cases	Average Reading of Group	Mode	Remarks
		Pos.	Neg.	Unknown				
General Paresis.....	25	20	..	5	.....	4445444321	5555554320	
Cerebro-spinal Syphilis.....	2	1	..	..	0112332100	.....	.....	
		1	..	..	0045555555	.....	.....	No autopsies.
Epilepsy.....	43	0	25	..	.....	1111111111	0111000000	
		..	..	18	.....	1111000000	0000000000	
Meningitis.....		..	1	..	0000000444	.....	.....	(Streptococcus mucosus)
		..	..	1	0000012343	.....	.....	B. tuberculosis.
		..	..	1	0000000345	.....	.....	Streptococcus.
		..	..	1	0001113443	.....	.....	Pneumococcus.
		..	..	1	0000002554	.....	.....	Meningococcus.
		..	..	1	0000000442	.....	.....	"
		..	..	1	0000003331	.....	.....	"
		..	..	1	0000000455	.....	.....	"
		..	..	1	0000244211	.....	.....	"
		..	..	1	0000033542	.....	.....	
All forms.....	10	..	..	..	.....	0000012443	0000000444	
Meningismus.....	3	..	..	..	.....	0000000000	0000000000	

Clinical Diagnosis	No. of Cases	Wassermann Test			Reading of Individual Cases	Average Reading of Group	Mode	Remarks
		Pos.	Neg.	Unknown				
Brain tumour.....	3	..	..	1	0000000000	.....	.....	No autopsy.
		..	1	..	0001100000	.....	.....	No autopsy.
		..	1	..	0014421000	.....	.....	Endothelioma.
Huntingdon's Chorea	2	..	..	1	1233220000	.....	.....	
		..	1	..	2234300000	.....	.....	
Manic, Depressive.....	5	..	..	1	0000000000	.....	.....	
		..	..	1	0000000000	.....	.....	
		..	1	..	0000000000	.....	.....	
		..	..	1	0000000000	.....	.....	
		..	..	1	1221100000	.....	.....	
Dementia Præcox.....	5	..	..	1	0000000000	.....	.....	
		..	1	..	0021110000	.....	.....	
		..	1	..	0000000000	.....	.....	
		1	..	..	1100000000	.....	.....	Under treatment.
		..	1	..	0000000000	.....	.....	
Unknown.....	10	..	10	..	.....	0111100000	0001100000	

The cases of general paresis were typical with the exception of one in which the clinical course suggested a possible dementia præcox plus a syphilitic infection. The spinal fluid, however, showed increased cells, increase of globulin, a typical curve with colloidal gold, and a strongly positive Wassermann. The curve for paresis was quite uniform in all cases except two in which the depth of colour change reached only to the point three. This occurred in the fourth tube in the one case and the fourth and fifth in the other.

The two cases diagnosed clinically as cerebro-spinal syphilis did not come to autopsy. The curves are distinctly different. From our experience with other fluids we do not believe that a curve for cerebro-spinal syphilis exists which can be distinguished from curves obtained with some non-syphilitic conditions, as for instance the case of endothelioma of the brain.

In five cases of epilepsy change of colour to the point three occurred. In two cases change of colour reached four, and in two others five. In all of these the Wassermann was negative. The curves may perhaps be accounted for by some admixture of blood serum, for further investigation of epileptics showed their spinal fluids to be practically inactive and they failed to give any characteristic curve. Also we have concluded in agreement with Swalm and Mann[6] that slight grades of colour change are not significant.

The curve in two cases of Huntingdon's chorea is interesting in being approximately the same, but no conclusions can be drawn.

Of the cases diagnosed as brain tumour only one came to autopsy and this was a case in which a suggestion of gumma was made from the colloidal gold test and the occurrence of a doubtful Wassermann in the blood serum. Later, however, a negative Wassermann was obtained in blood and spinal fluid and the post-mortem examination showed a large endothelioma.

The group of cases of meningitis is interesting as showing agreement in the position of maximum colour change in the end zone in spite of a variety of infective agents. There is even more agreement here than in the group of five cases of tuberculous meningitis mentioned by Grulee and Moody.[4] It should be pointed out that in any form of acute meningitis with the location of the bacterial irritant upon the brain coverings, there will be added to the normal cerebro-spinal fluid in varying quantities the elements of an inflammatory exudate which in its fluid part will consist largely of the constituents of blood serum.

We have found that if spinal fluids which show no change with

colloidal gold have added to them varying proportions of blood serum before the test is set up, such mixtures will give reactions which are practically identical with those obtained in suppurative or tuberculous meningitis. When one tenth or more serum is present the height of colour change usually occurs in the last four dilutions of the series. Decreasing the proportion of serum tends to cause the maximum point of colour change to travel towards the left so that curves occur in the mid zone though the degree of change may not be as great.

This suggests that quantitative differences in the exudate in the spinal canal will produce different curves with colloidal gold and may offer some explanation of Grulee and Moody's findings. It also demonstrates the importance of having fluids uncontaminated by even minute quantities of blood serum, and also casts some doubt on the value of midzonal curves. It is doubtful too, if end zone precipitation should be accounted of any value in the diagnosis of meningitis if unaccompanied by an increase of cells.

In the group marked "meningismus?" one case was typhoid fever, but the other two may have been abortive types of epidemic meningitis for there was an increase of cells but no definite increase of globulin and the patients recovered, one without any further puncturing and the other after receiving a dose of antimeningitis serum at the time of the first puncture, and only one other puncture thereafter.

A group of cases is listed where the clinical diagnosis was not obtained but in which the Wassermann reactions were negative. No precipitation occurred in the luetic zone with any of these cases. The constancy of the curve in general paresis has suggested that the substance responsible for the precipitation of the colloidal gold may be the same as that constituent of blood and spinal fluid which accounts for a positive Wassermann reaction. Recently, however, Weston[8] has concluded that the substances concerned are not identical.

Repetition of the experiments with mixtures of blood serum and spinal fluid and repeated tests on the same fluid with different indicators has disclosed the fact that there is sometimes a distinct variation in the sensitiveness of the colloidal gold solutions even when made by the same method. We also tried solutions made by the use of a small crystal of pyrogallic acid in place of the formaldehyde solution. These indicators although of a beautiful ruby colour were sometimes such comparatively stable colloids

as to be unaffected by the fluid of a typical paretic or by salt solutions of considerable strength.

Colloidal solutions are said to vary according to the electrification, size and number of their particles. In the case of the gold solution the electrification does not alter in quality but certainly by different methods of preparation it can be shown that the number and size of the particle will vary to such a degree that some solutions will precipitate where others will remain quite inactive with the same and even larger quantities of protein or electrolyte. That variations occur in the precipitability of colloidal gold solutions made by the formaldehyde method we believe to be not infrequent, and hence differences in curves with fluids from the same type of case may result not from quantitative differences in the fluids but from qualitative differences in the indicators. It is quite evident that in the Lange test the preparation of the gold solution by the formaldehyde method must be adhered to, but it may be advisable to test every indicator for its sensitiveness either by the use of a known paretic fluid or possibly by titration with an electrolyte. We have endeavoured to arrive at a colloidal gold solution of definite sensitiveness by setting up a series of ten tubes containing chemically normal NaCl from ·05 c.c. to .5 c.c. making up to constant volume and then adding 5 c.c. of indicator. It would seem to us unwise to use an indicator which will not precipitate in at least the last five tubes of such a series.

Our conclusions concerning this test at the present stage of our experience with it we may summarize thus:

1. The colloidal gold test in cerebro-spinal fluid forms a valuable confirmatory test for general paresis.

2. No constant curve of precipitation occurs in epilepsy.

3. A very small admixture of blood serum will render results unreliable.

4. No special significance can be attached to curves with the maximum of precipitation in the mid zone.

5. Slight degrees of colour change are not significant.

6. Maximum precipitation in the end zone occurs in most cases of acute meningitis but there is no definite relation to the causative organism.

7. Each indicator should be tested for its sentitiveness before use.

References:

1. Grulee and Moody, *J.A.M.A.*, July 5th, 1913.
2. Lee and Hinton, *Am. J. Medical Sciences*, July, 1914.
3. Solomon and Koefod, *Boston Med. and Surg. J.*, December 10th, 1914. (Abstract *J.A.M.A.*, January 2nd, 1915.)
4. Grulee and Moody, *Am. J. Diseases of Children*, January, 1915. (Abstract *J.A.M.A.*, January 23rd, 1915.)
5. Solomon and Welles, *Boston Med. and Surg. J.*, March 18th, 1915. (Abstract *J.A.M.A.*, April 3rd, 1915.)
6. Swalm and Mann, *New York Med. Journ.*, April 10th, 1915. (Abstract *J.A.M.A.*, May 1st, 1915.)
7. Weston, Darling and Newcomb, *Am. J. Insanity*, April, 1915. (Abstract *J.A.M.A.*, June 5th, 1915.)
8. Weston, *Journal Medical Research*, March, 1916.

The Miramichi Hospital at Newcastle, New Brunswick, was formally opened on July 1st. The hospital is the gift of Mr. Ernest Hutchison. The building is of native sandstone and overlooks the Miramichi River; it has a frontage of 144 feet, with an average depth of 40 feet, and is equipped with every modern convenience including an *x*-ray room, an electric elevator, and laundry. The cost of maintenance will be borne by public subscription and endowments amounting to about $6,000 have already been made. Accommodation is provided for from forty to fifty patients.

MEDICAL WORK AT A BASE HOSPITAL IN FRANCE

By F. G. Finley, M.D.,

Lieutenant-Colonel C.A.M.C.

DURING the past winter a considerable number of medical cases were treated at the Base hospitals in France. The ratio of sick, however, to the vast numbers engaged in the British forces was extremely small; serious illness played an unimportant rôle, a large proportion of the cases being of a comparatively trivial character.

Influenza was prevalent during the winter and spring months, the disease running a febrile course of from three to seven days. The abrupt onset with catarrhal symptoms, violent frontal headache, severe pains in the back and limbs and often profuse perspirations recalled the character of the disease as seen in civil practice; vomiting and diarrhœa were only exceptionally present, whilst convalescence was not associated with that degree of weakness and prostration which is such a marked characteristic of this malady.

A mild type of bronchitis was frequently seen. No cases were observed of the extremely severe and sometimes fatal purulent bronchitis seen during the previous winter in both England and France.

Although predictions as to the probable frequent occurrence of pneumonia were freely made, these have proved as false as most of the predictions relating to the war. Very few cases of lobar pneumonia occurred during the winter, the number increasing during the spring months. Broncho-pneumonia on the other hand was of more frequent occurrence and a considerable number of cases developed in wounded men, in whom lowered resistance from hæmorrhage or infected wounds, infection from the prevalent tracheitis and bronchitis, and as a result of ether anæsthesia, may perhaps be regarded as determining causes. Pulmonary tuberculosis and pleurisy with effusion formed an appreciable but small proportion of sick cases.

Articular rheumatism, so long regarded as due to cold and wet, also proved to be quite exceptional, certainly much rarer than in civil practice.

Under the term of myalgia great numbers of men were admitted with varying degrees of pains in muscles and bones. The frequency and duration of this class of case rendered it important as a cause of disability. The clinical manifestations of many of these cases consisted in severe pain in the back, thighs, and legs, often described as of agonising intensity and so severe at night as to prevent sleep. There was often a history of a febrile onset and headache, and although the usual course was afebrile, there were often repeated short periods of fever, and objectively in some instances enlarged spleen. The mode of onset and the splenic enlargement suggest an infection. Some of the cases had an onset precisely like influenza, including catarrhal symptoms, but with an unusual continuance of the limb pains. Others again were probably examples of French fever. Captain G. A. Brown, of No 3 General Hospital, described a class of cases of "French shins", accompanied by intense pain in the shins and a mononuclear increase of leucocytes, a sign probably indicating bone infection. The duration of many of these myalgic conditions was prolonged, lasting for several weeks. Treatment seemed to have but little influence on the duration of the malady or on the severity of the pains. Opiates alone had a decided action in alleviating pain, whilst iodides, salicylates, coal tar drugs, heat, cold and baking were of little value.

Acute nephritis was one of the most striking diseases met with. The large number of cases was very suggestive of an infective origin. Although the cases increased in winter yet very few occurred during the first winter of the war, indicating that cold and exposure alone could not be the actual cause, and that some more obscure origin was operative. Clinically the cases began suddenly with chilly sensations, headaches, œdema and dyspnœa. This last symptom was a very constant feature, coming on not only during exertion, but occurring in paroxysms especially at night. The urine presented a large amount of albumen and numerous granular, hyaline and epithelial casts, whilst blood was almost invariably present microscopically and in some cases tinged the urine to a brown or even red colour. Whilst the œdema and dyspnœa passed off in the course of a week or two, albuminuria was more persistent. The blood pressure was often raised from 150 mm. to over 200 mm. Although complete recovery ensued in a number of cases, there will doubtless be a considerable residue of cases passing on to a chronic condition.

Perhaps the greatest triumph of the Royal Army Medical

Corps has been the control and practically the abolition of typhoid. This result is due to preventive inoculation and to careful sanitary precautions. Laboratory examinations are carred out for carriers and when positive the individual is isolated. Para-typhoid is more prevalent than the genuine disease, the cases running as a rule a shorter and milder course that true typhoid.

Tetanus has also been controlled by preventive doses of antitoxin. Unfortunately the period of immunity is short and a second dose is necessary in all prolonged cases of suppurating wounds. In one hospital a small epidemic was immediately checked by the routine administration of antitoxin to all wounded men, care being taken to administer a small preliminary dose to prevent anaphylactic shock.

THE fourth annual convention of the Cremation Association of America will be held in the auditorium of the Hotel Gibson, Cincinnati, on the 24th and 25th of this month.

THE annual meeting of the American Medical Editors' Association will take place at the McAlpin Hotel, New York, on October 25th and 26th, next, under the presidency of Dr. Edward C. Register, editor of the *Charlotte Medical Journal*. The meeting will be devoted exclusively to problems of a journalistic nature and an interesting programme has been prepared.

MENINGOCOCCUS MENINGITIS

By J. G. Fitzgerald

Associate Professor of Hygiene, and Director of the Antitoxin Laboratory, University of Toronto

MENINGOCOCCUS meningitis, cerebro-spinal fever or cerebro-spinal meningitis has been recognizable as a distinct entity since Weichselbaum[1] published the result of his study of six cases of the disease in which the clinical and bacteriological findings were for the first time fully correlated.

Pathological conditions involving the meninges of the brain and spinal cord were known long before the appearance of the above communication in 1887; but this served the purpose of stimulating further investigation of the meningitides, particularly when the disease process presented epidemic features. The classical study of Councilman, Mallory and Wright[2] of the outbreak of meningitis in Boston in 1896, well illustrates this. It is a curious fact, that, until recently (the outbreak in Greece in 1911 being the most noticeable exception) the most severe epidemics have occurred in America, despite the fact that the first outbreak of the disease in epidemic form, was reported from Geneva in 1805 by Vieusseaux. France and Denmark, Sweden, Germany, and Ireland, however, all suffered in the hundred years between 1805 and 1905. Nevertheless, the greatest ravages of the disease have been observed in North America, as illustrated by the recent epidemics in New York City and in Texas.

It is not the purpose of the present writer to review the facts regarding the varieties of meningitis due to *B. tuberculosis*, the pneumococcus, streptococcus, *B. typhosus*, *B. influenzæ* or allied microörganisms, the object of this paper being simply a study of the principal features of ninety-five cases of meningococcus meningitis, the histories of which have been accessible. In addition, certain bacteriological data have been obtained as a result of personal investigation.

The subject has recently taken on added interest for several reasons. Firstly, it has long been known that the concentration of

Read at the Annual Meeting of the Ontario Medical Association Toronto, June, 1916.

Received for publication, June 12th, 1916.

large numbers of men in barracks under conditions necessitated by military exigencies has favoured outbreaks of epidemics of meningococcus meningitis. Ontario has had an example of this during the past year and a half. In the second place after being accepted as the etiological agent in epidemic cerebro-spinal meningitis for thirty years, the rôle of the *Micrococcus intracellularis meningitidis* of Weichselbaum in this disease, has recently been challenged.

Hort[3] and his collaborators in three recent publications have maintained that the meningococcus has not been proven to their satisfaction to be the "primary infective agent" in epidemic cerebro-spinal fever. As a result of bacteriological investigation and animal experimentation it is suggested that the true etiological factor is a so-called "filter-passer" or filtrable organism, the exact nature of which has yet to be determined. The evidence adduced by Hort and his co-workers when examined by the Special Advisory Committee upon Bacteriological Studies of Cerebro-Spinal Fever during the epidemic of 1915, consisting of Andrewes, Bulloch and Hewlett (appointed by the Medical Research Committee under the National Health Insurance Act) is commented upon as follows in their report[4]: "We find such views (as those of Hort) far from convincing and they are at variance with the experiences of the overwhelming majority of bacteriologists who have studied this disease." Since the above report was published Hort's third paper has appeared. In addition Caulfeild[5] who has recently been associated with Hort, in two personal communications to the writer, claims to have proven in monkeys that (a) the filtrates, of cerebro-spinal fluid from cases of meningococcus meningitis after passage through Chamberland filters, are definely pathogenic for these animals, often after an "incubation interval" when injected subcutaneously or intra-peritoneally. They are said to be just as infective, or more so, than the original cerebro-spinal fluid; (b) certain fluid cultures of cerebro-spinal fluid have been grown which have shown a "suspended haze", in which bacteria could not be demonstrated, but such cultures could be proven to be infective in monkeys; (c) post-mortem investigation of these monkeys did not result in recovery of cultures of the meningococcus; (d) the cerebro-spinal fluid from a monkey injected previously with the filtrate and running a temperature of 104° F., may fail to show organisms but gives this "haze" in the cultures, and injected into normal monkeys is capable of producing a high fever.

The evidence here presented by Hort, Caulfeild, and those working with them, is most interesting and while it is too soon to

arrive at any definite conclusion, further communications will be awaited with much interest. In the meantime well-sanctioned procedures adopted in the past to aid in diagnosis and treatment should certainly not be discarded.

The writer has been able to collect certain salient facts in regard to ninety-five cases of the disease occurring in Ontario since August, 1914. Of these cases, forty were patients admitted to the Hospital for Sick Children, Toronto, and I am indebted to Dr. Allen Baines for kind permission to utilize material contained in the clinical histories. I am similarly indebted to Professor A. McPhedran, Dr. W. B. Thistle, and Dr. G. W. Ross for their kindness in affording access to the histories of thirty-four cases treated in the Toronto General Hospital during this time. Lieut.-Colonel F. W. Marlow, of Toronto, has very courteously placed the available clinical histories of cases in the Second Military District at my disposal as has Lieut.-Colonel W. T. Connell, of Kingston, who, in addition has supplied eight cultures of meningococci. Finally, I wish to thank Dr. W. D. Scott, of Peterborough, and Dr. C. A. Drummond, of Meaford, for the trouble they have taken in furnishing data on cases treated by them.

An analysis of any considerable number of cases of meningococcus meningitis will usually reveal two types of the disease. First, the true epidemic and secondly, the sporadic cases. Those which I have analysed consisted of both sporadic and epidemic cases. The epidemic cases occurred chiefly at Exhibition Camp, Toronto, during the winter of 1915. At that time the disease was also epidemic amongst enlisted men in Belleville and London. The records of the cases in the last mentioned places are not available for this study. The first epidemic case at Exhibition Camp, Toronto, made its appearance on February 8th, 1915; four more cases were diagnosed between February 14th and 16th, and between this date and April 24th, eleven additional cases occurred, making sixteen in all. Of these eight died, and eight recovered. Energetic measures, to be discussed more fully later, were taken and the outbreak was soon checked. Having in mind the experience of the previous winter every care was taken to prevent an outbreak during the winter of 1915-1916. As a result possibly there were only six sporadic cases, three of which were in men billeted in centres outside Toronto. All six cases recovered under vigourous treatment. No two cases were in men of the same unit or in men living in the same building.

During this period between August, 1914, and April, 1916,

twenty additional cases were admitted to the Toronto General Hospital and thirty-eight were treated in the Hospital for Sick Children. It is impossible from a study of the histories to determine exactly the sporadic and the epidemic cases except in a certain few, as in the following tragic instance:

Mrs. A. H., age thirty-four. Admitted to the Toronto General Hospital, February 26th, 1915, with history of symptoms of meningitis dating back to February 22nd, died on the fifth day after admission.

John H., age eight, son of Mrs. A. H., admitted to the Hospital for Sick Children, February 27th, history of complaints of headache and sore throat dating only from day of admission, died on thirteenth day after admission.

Nellie H., age thirteen months, sister of John H., and infant daughter of Mrs. A. H., admitted to Hospital for Sick Children, February 27th, history of illness for two days. Nursed by mother until February 21st. Died on the second day after admission.

George H., age five, second son of Mrs. A. H., admitted to the Hospital for Sick Children, March 6th. History of illness of only a few hours duration, died on the sixteenth day after admission. This family of the mother and three children was completely wiped out by this epidemic tragedy. Furthermore, it is noted in the history, that a boarder at the home of Mrs. A. H. who was at Exhibition Camp also had meningitis and there was evidence suggesting that the mother contracted the disease from him. Here the contact and spread of infection was only too evident. The great majority of the other cases studied, however, might be classified as sporadic.

In this division into sporadic and epidemic cases it is well to recall the conclusions of Andrews, Bulloch and Hewlett[6] in their special report where they conclude that: "The epidemic is not one of cerebro-spinal fever as such but what may be termed a "saprophytic epidemic" of the meningococcus in the throats of the population at large, governed as to its local incidence by the opportunities afforded for transfer of the coccus from pharynx to pharynx. It is an epidemic prevailing in winter and early spring because climatic conditions bring people into closer contact indoors at that season; it dies out in summer for the converse reason. The conditions of camp and barrack life render it preëminently liable to affect the military population. It probably prevails in towns to a much greater extent than in the country owing to the closer aggregation of the population. This menigococcal epidemic presents no objective or subjective features to attract attention and is revealed only

by systematic bacteriological observation. Cerebro-spinal fever is an epiphenomenon of the epidemic. It is due to a secondary systemic invasion by the meningococcus from its saprophytic focus in the nasopharynx, occurring in sparse and isolated cases which appear as a rule unconnected with each other, At present we do not know the conditions which determine the secondary invasion, nor have we the data for judging in what proportion of the cases it takes place, though it seems a very small one. We know the number of cases of the declared disease but not the total number of cases with pharyngeal infection. As regards these latter we can only form a crude guess from the proportion of so-called "positive contacts" detected.

If we accept this view which had much evidence to support it in the analysis of the ninety-five cases here examined, the epidemic is one of meningococci in the nasopharynx and not of the so-called epiphenomenon, cerebro-spinal fever. At Exhibition Camp during the winter of 1915, something over one thousand swabs taken from the nasopharynx of "contacts" and other enlisted men were examined. In this number seventy-two positive carriers in all were found. In the same camp in the winter of 1916, fourteen hundred swabs were examined from contacts and mess-orderlies and only one positive carrier was determined, fifteen others being regarded as "suspicious". During the winter of 1915, fifteen cases of the disease were reported in about two months. In the same camp with somewhat more men in 1916, only three cases were reported in over four months. Here then we have seventy-two carriers and fifteen cases of the disease in two months during 1915, and one carrier and three cases, several months apart, during 1916. The interesting fact has to be kept in mind also that during March, 1916, numerous sporadic cases were reported to the Health Department in Toronto as having been observed in the city, and only one case occurred in Exhibition Camp. Even allowing for additional precautions it would seem that during the winter of 1915 we had an epidemic of meningococci in the naso-pharynx, and in 1916 only sporadic indications of such a condition.

Of the cases reported from outside points, about one half of Colonel Connell's fourteen cases seemed to be epidemic, others, however, were sporadic as were cases either seen or reported in Brampton, Brantford, Barrie, Peterborough and Meaford. Similarly the majority of the other cases in the Toronto General Hospital and the Hospital for Sick Children especially during 1916, seemed to have no direct connexion with any previous case of the same disease.

The essential difference, then, in this disease manifesting itself as an epidemic consists in the larger number of persons harbouring the microörganism and *pari-passu* the greater liability of more cases developing. The fundamental reason why we have so-called sporadic cases constantly and epidemics occasionally is not explained, nor can any satisfactory explanation be offered in the present state of our knowledge. The disease is probably much more prevalent than is generally supposed, but so little attention has been paid to the matter because of certain difficulties in the way of diagnosis and because only in times of epidemics or threatened epidemics has interest been aroused.

For the year ending December 31st, 1914, sixty-eight cases of so-called cerebro-spinal meningitis were reported to the Provincial Board of Health of Ontario. In this series fifty-five deaths were reported. It is impossible to tell how many of these cases were due to meningococcus and how many to other microörganisms. It is highly desirable that a bacteriological examination of the cerebro-spinal fluid be made in each case and certain diagnosis of the variety of meningitis be thus arrived at. The very high mortality is evident, and by comparing it with the sixty deaths in twenty-seven hundred and twenty-two cases of scarlet fever reported in the same year in Ontario, with sixty deaths in forty eight hundred and eighty-four cases of measles and with fifty-six deaths in seven hundred and ninety-eight cases of whooping-cough, it is further emphasized.

In the series of cases here reported diagnosis was made in all cases by an examination of cerebro-spinal fluid obtained by lumbar puncture. This should be done in every suspected case. In the majority of these cases smears only were made and only in about one fifth of the cases were cultures also obtained. In the present state of our knowledge, the demonstration of a very turbid cerebro-spinal fluid with enormous numbers of leucocytes, and the finding of Gram-negative diplococci inside or outside the cells, in smears, is probably all that is necessary in order to arrive at a diagnosis of meningococcus meningitis. It is desirable, however, when it is possible, that culture also be made.

Certain facts in regard to age, incubation period, history of onset, duration of illness, progress of case, treatment, outcome, etc., have been ascertained in about eighty of the cases here reported and they will next be briefly discussed.

In ninety-one cases in which the age was ascertained there were:

Under 1 year	7 cases
1 year to 2 years	8 cases
2 years to 5 years	11 cases
5 years to 10 years	16 cases
10 years to 15 years	4 cases
15 years to 20 years	15 cases
20 years to 25 years	12 cases
25 years to 30 years	8 cases
30 years to 40 years	7 cases
40 years to 50 years	2 cases
50 years	1 case

Thus forty-two of the cases were between two and ten years of age, thirty-one between ten and twenty-five years of age and seventy-three of the ninety-one cases or 80 per cent. were twenty-five years of age or under. Apparently in this group of cases, children and young adults were about equally susceptible. Only 10 per cent. were over thirty years of age.

The incubation period of the disease is exceedingly difficult to determine from the history and the literature bearing on this point is meagre. In thirty-eight of the cases under consideration there was a fairly definite history of incubation as follows:

5 days or under	20 cases
6 days or under	3 cases
7 days or under	6 cases
8 days or under	3 cases
10 days or under	3 cases
11 days or under	1 case
14 days or under	2 cases

From this small group then it appears that twenty-nine of the thirty-eight cases had an incubation period of seven days or less and twenty of these twenty-nine cases five days or less.

It is well known, however, that an individual may harbour the microörganism in the nose for a long period of time, and eventually show symptoms of the disease. This is well illustrated in a case reported by Andrewes, Bulloch and Hewlett.

The onset in the great majority of all cases is very abrupt. Headache, vomiting, convulsions and sudden rise of temperature, were the characteristic symptoms of onset in about the order of frequency here named. Subsequently, retraction of the head and rigidity of the neck frequently followed. The degree of retraction and rigidity varied considerably but was almost always observed fairly early.

In only fourteen of seventy-six cases were rose spots or petechiæ noted, which is less than 20 per cent. This, however, may be due either to the fact that, in some cases they may have disappeared before admission to hospital, or were not mentioned in the clinical history. However, it is certain that in from 30 per cent. to 40 per cent. of cases, spotted-fever would be an inapt designation for this disease. Kernig's sign was observed in thirty-one cases in a series

of thirty-four. Taché cerebrale was less frequently observed. Disturbances of consciousness were present in almost all of the cases. Delirium was occasionally pronounced. The duration of the disease was quite variable. It has been stated that in epidemics, that the earlier cases are usually more severe and later cases are much milder. This seemed to be borne out at first, at Exhibition Camp, during the winter of 1915, when the first five cases all died, of the second five, only one died; however, of the remaining six cases, two died and these were the last cases occurring in the camp; so judging by this limited experience of sixteen cases the mildest cases are not necessarily the end cases.

One of the most characteristic findings of course is the change in the cerebro-spinal fluid. From a clear, watery fluid frequently not showing on the average one cell to the cubic millimetre of fluid, it becomes intensely turbid with a cell count of from a few hundred to 30,000 per c.cm. Oille, has attached certain prognostic significance to this high cell count in the cerebro-spinal fluid. He believes that cases with a count above 10,000 per c.cm. seldom recover. The cases with cell counts under 1,000 per c.cm., however, are also sometimes fatal. In thirty-four cases admitted to the wards of the Toronto General Hospital, an analysis plainly shows that in this limited number of cases, those with a cell count of 1 to 5,000 per c.cm. were more likely to recover than those with a cell count of from 5,000 to 30,000 per c.cm. The protein content of the cerebro-spinal fluid is also greatly increased in amount. The fluid is under markedly increased pressure and this is of diagnostic value and is a useful guide in treatment, because, with a clear fluid under only slightly increased pressure, the outlook is very favourable. Two or three cases have been observed where the fluid became so thick it would no longer run through the needle used for lumbar puncture. In one case this occurred within seven days of the onset of symptoms.

An analysis of the duration of the disease has revealed certain interesting features. In eighty-nine cases, the condition has varied in duration from one to one hundred and forty-three days. In forty cases where the duration of the disease was twenty-four days or less, nine recovered (sixteen of the forty cases died in less than seven days), thirty-three cases lived from twenty-five to fifty days, of this group twenty-four recovered and nine died. One case was reported cured after ten days, this is the shortest time in which any patients were discharged as recovered. The remaining sixteen cases lived from fifty to one hundred and forty-three days, of these eleven recovered and five died.

Thus the death rate in the cases of three weeks or less duration was 77 per cent.; of those in which the duration of the disease was from twenty-five to one hundred and forty-three days the death rate was only about 35 per cent. The progress of the case is best followed by careful examinations of the cerebro-spinal fluid. Where this does not clear up, where headache and opisthotonus continue and where mental dullness increases the outlook is very grave. In those cases where the fluid does not clear up the prognosis is hopeless. Even where the fluid does clear up death may ensue eventually from a basic-meningitis. Sometimes a plastic exudate walls off the infecting agent; increased pressure results and even if death does not occur hydrocephalus or other complications result. A sudden exacerbation in temperature may also be a danger signal of a relapse especially if delirium is an accompanying symptom, as pointed out by Neal.[7] Neal believes also that the reduction of Fehling's solution by the cerebro-spinal fluid is a prognostic point of importance. The outcome in a given case depends upon so many factors that a guarded prognosis at the outset is usually desirable.

Perhaps the most interesting part of the subject is that which relates to treatment. Since the work of Flexner, Park and others in America, it has come to be accepted that the death rate from meningococcus meningitis has been reduced from about 75 per cent. to 25 per cent. or 30 per cent. The following statistics quoted by Kolmer[8] tend strongly to uphold this point of view.

	Cases.	Average Mortality.
Flexner	1294	30·8 per cent.
Dopter	402	16·44 per cent.
Netter and Debre	99	28 per cent.
Sophian	161	15·5 per cent.

Furthermore the results of Christomanos in the recent severe epidemic in Greece were eminently satisfactory. Simlarly Ker, of Edinburgh, and Gardner Robb, of Belfast, have had most excellent results. In a recent symposium held at the Royal Society of Medicine, Sir William Osler[9], Gardner Robb, H. D. Rolleston, Foster, Gaskell, Sutherland, and Neave contributed to the discussion and their remarks have aroused much interest. With the exception of Robb, all these authors reported disappointing results from the use of anti-meningitis serum. Robb whose experiences with the epidemic form of the disease is much the most extensive of those just named has a mortality in one series of one hundred and twenty cases or 24 per cent., and in another series of one hundred cases a mortality of 36 per cent. The explanations of the failure

of serum treatment in the hands of the English observers have been varied, but the potency of the different sera used has been seriously questioned.

In the series of ninety-five cases here reported, forty-six died and forty-nine recovered. These results, as a whole, are not satisfactory. An endeavour has been made to determine in different cases the origin of the serum used in the treatment, but this has been very difficult. However, recent communications by Ellis[10] and Arkwright[11] have shown that amongst meningococci there are various strains of these microörganisms which may account for the fact that a serum may not contain antibodies for the organisms responsible for the production of cases of the disease. In this way an absolutely inert serum quite incapable of agglutinating the meningococcus isolated from the given case may have been used in the treatment. To determine whether this is a factor of importance, we are at present immunizing horses for the first time with strains of meningococci from cases occurring in Ontario combining with them strains obtained from the Rockefeller Institute. The most recent method of immunization described by Amoss[12] is the one being used. At present fifty-two cultures of meningococci are being utilized in this laboratory for this purpose. R. D. Defries working in the Antitoxin Laboratory of the University of Toronto has devised a combination thermos-hot-water-bottle outfit which is being used to send out to physicians reporting cases of the disease. The physicians are supplied with culture media and directions are enclosed as to the method of obtaining the fluid for the culture. It is hoped that in this way a serum will eventually be obtained which will be effective in materially lessening the death-rate from meningococcus meningitis in Ontario.

The method of procedure when a suspected case of meningococcus meningitis is seen, is to do a lumbar puncture at once. A general anæsthetic (chloroform) may be used if necessary. Gardner Robb, Captain Michael Foster, and we ourselves, believe this to be frequently desirable. Smears, and if possible cultures, should be made at once. It is useless and only confuses the issue, to inject serum if an organism, other that the meningococcus is demonstrated in the fluid. If no organism is demonstrated in a thick purulent fluid, cultures should be attempted if at all feasible and serum used. Daily lumbar punctures should be made until the pressure becomes normal. Thirty to forty c.c. or more fluid may be withdrawn at each puncture and slightly less serum introduced. Certain of the English writers mentioned above, believe that lumbar puncture alone is of great value and does as much good as serum.

This latter is very questionable. Serum should be used in considerable quantities and at regular intervals as pointed out in the article by Neal, already quoted. Connell[13] recommends that serum be given not only intra-spinally but also intravenously and by intramuscular injection. In a series of fourteen cases so treated he had thirteen recoveries. This method of treatment is based on the view expressed by Lundie, Thomas, Fleming and Maclagan[14] that there is a septicæmic stage in the disease. The cases should be isolated and all the usual measures taken to make certain that the patient will not infect others. Further prophylactic proceedings in camps or where the disease is widespread consist in swabbing to determine possible carriers. The sterilization of all dishes used in common, by enlisted men, is insisted upon at Exhibition Camp. Routine swabbing of cooks and mess orderlies has also been instituted. These precautions with avoidance of overcrowding in stuffy, ill-ventilated quarters will undoubtedly minimize the opportunities for transference of the meningococcus from one individual to another.

The writer is indebted to Dr. George M. Cameron and to Miss Olive Sheringham for assistance in abstracting histories.

BIBLIOGRAPHY

1. Weichselbaum. *Fortschritte. d. Medizin*, 1887.
2. Councilman Mallory and Wright. "Special Report Massachusetts State Board of Health, 1898."
3. Hort Lakin and Benians.
   (a) *British Medical Journal*, March 27th, 1915.
   (b) *Ibid*, April 24th, 1915.
   (c) *Journal of the Royal Army Medical Corps*, February, 1916.
4. Medical Research Committee, 1916. "Report of the Special Advisory Committee upon Bacteriological Studies of Cerebro-Spinal Fever during the epidemic of 1915."
5. Caulfeild. "Personal communications, March and April, 1916.
6. Andrewes, Bulloch and Hewlett. "Report of the Special Advisory Committee upon Bacteriological Studies of Cerebro-Spinal Fever during the epidemic of 1915," p. 56.
7. Neal. "Treatment of cases of epidemic meningitis." *Journal American Medical Association*, March 18th, 1916, pp. 862-864.
8. Kolmer. "Infection, Immunity and Specific Therapy." 1915. P. 747.
9. Osler, Robb, etc. *The Practioner*. War No., January, 1916. Pp. 2-34.
10. Ellis. "A classification of meningoccoci, etc." *British Medical Journal*, December 18th, 1915.
11. Arkwright. "Grouping of the strains of meningococcus." *British Medical Journal*, December 18th, 1915.
12. Amoss and Wollstein. "A method for the rapid preparation of anti-meningitis serum. *Journal of Experimental Medicine*, March, 1916. Pp. 403-418.
13. W. T. Connell. "Personal communication," April, 1916.
14. Lundie, Thomas, Fleming and Maclagan. *British Medical Journal*, March 20th, 1915, p. 493. May 15th, 1915, p. 836.

THE DEFINITE TREATMENT OF PNEUMONIA:

With a Report of the Germicidal Power of Quinine and other Cinchona Derivatives upon Pneumococcus Cultures *in vitro*.

By Solomon Solis Cohen, M.D.

Professor of Clinical Medicine in Jefferson Medical College, Philadelphia.

(*Author's Abstract*)

Clinical

FOR generations quinine has had a traditional, empirical reputation as a potent agent in the treatment of lobar and lobular pneumonia and similar maladies. Systematic employment of the drug according to a definite plan, for a period of twelve years—thus during seasons of varying meteorology and epidemic virulence—has given abundant evidence of the correctness of this tradition.

In many of the cases so treated, recovery would probably have been as certain without the drug as with it; but in no case did it prevent recovery, and in a large number it averted death. Some patients in the author's service do not receive it. As a rule, however, the initial dose is given on admission, and repetition is determined by circumstances. In those cases which give no indication for repetition of the dose, recovery is practically invariable. In the severer cases—those calling for repeated doses—mortality has been greatly reduced even among alcoholics and derelicts; and the clinical picture is commonly changed from profound distress to comparative comfort, not only in cases of happy ending, but also in the fatal ones. In other words, toxæmia is overcome or minimized. Thus cough is not troublesome, delirium and insomnia are much less frequent, and respiration, even when rapid, is not laboured in anything like the ordinary degree. Hence the use of hypnotics, of sedatives, and of oxygen, is rarely called for. The best results are observed in patients seen not later than the third day of overt

Received for publication June 27th, 1916.

Presented by invitation at the meeting of the Ontario Medical Association, June 1st, 1916.

symptoms—which may be the seventh or tenth day, or even later, of actual disease—and in those less than fifty years of age; but surprising recoveries are met with in late cases and old persons.

Two significant features of the clinical picture are to be emphasized; first, the common change from critical to gradual termination (lysis); second, the extreme rarity of cinchonism (two cases in five hundred), notwithstanding the enormous doses of quinine sometimes administered. Cinchonism, profuse sweating, or marked fall of blood-pressure following the use of quinine call for caution; perhaps for withdrawal of the drug. In no case of the author's has there been quinine amaurosis. One case of amaurosis has been reported to him by a pupil, but the trouble was transient, and the patient was saved from what seemed to be impending death.

The treatment to be outlined, however, is not specifically treatment by quinine. Quinine is used as the "big gun" in its tactics, but if a better gun is found, this could be substituted without changing the strategy of the method. It is termed the *definite treatment* of pneumonia, to distinguish it from the vagueness of expectancy on the one hand, and the exactitude of specific treatment on the other hand. It is not primarily, or chiefly germicidal. In pneumonia, after the first day, more is needed than merely to slay the microscopic Goths and Huns. We must protect the body against the poisons which they manufacture, or which may be manufactured by the enslaved or struggling tissues. We do not know as yet what the pneumonia poisons are. We merely observe their effects. The definite treatment is directed chiefly against these. Its *strategical* plan is based upon an analysis of the phenomena of crisis, and seeks to avert the profound and dangerous disturbances of that period. Into this plan, a number of *tactical* measures, old and new, are incorporated; varying with the condition of the patient, the environment, the available means; and modified according to the effects produced. As gradually developed in the writer's services at the Philadelphia General Hospital and the Hospital of the Jefferson Medical College, it comprises the following features:

A. GENERAL:

1. An abundant supply of *fresh air*, preferably in the open, and with due care to preserve the warmth of the body by adequate covering, and if necessary, external heat.

2. All the esentials of *good nursing;* including *rest*, proper *diet*,

and the free use of *water*, internally and externally. Copious *diuresis* is especially sought.

3. Keeping the *thorax constantly warm* by poultices during the day and a lamb's wool jacket at night. This may be preceded, in early cases, by *counter-irritation* with a mild mustard and flour poultice.

4. A due supply of *chlorides* by saline infusion (Henry's method), alkaline-saline beverage (author's method), or the administration of a mixture of the chlorides in capsule, followed by copious drafts of water (Quimby's method).

5. Such additional measures of *elimination* (and *alkalinization*) as may be necessary.

6. *Cleansing and* (relative) *disinfection of the upper air passages* by local applications to the throat and nose (phenol-iodine-glycerin or silver preparations), or by continuous inhalation (from the perforated zinc respirator of Yeo) of volatile antiseptics, stimulating or sedative (*e.g.* ethyl iodide, creosote, chloroform, terebinthinates).

This represents a *ground work* upon which certain *definite* medication is superimposed.

B. Special:

1. Antitoxic Agent. Quinine is given *promptly in massive and repeated doses* (for a vigourous adult, 1·6 to 1 gm. (25 to 15 grains) *circa q. iii h.*) with *progressive lessening of quantity and increase of interval*, according to effect; the drug being intermitted when the temperature (taken in the mouth) tends to remain below 102.·5°F., and resumed when it tends to rise above 103°F. The temperature curve, however, is taken as an *index only*, since the treatment is not designedly antipyretic; and temperatures too low are not desirable. This medication may be kept up for one, two, or three days. There may be one dose of quinine only, or so many as fifteen. The rule is effect, not quantity—*enough and no more.* Perhaps four to five doses is a fair "average". *Quinine and urea hydrochloride* (25 to 50 per cent. recent (sterile) solution*) and *intramuscular injection* (through the *iodized skin*†) have been chosen as, on the whole, the most effective preparation and method; but other quinine salts, and administration by the mouth, are likewise employed. It is possible that other cinchona derivatives,

*It is best made extemporaneously with boiling water, and used at a moderate heat.

†The point of puncture should be sealed with collodionized cotton.

for example *methyl-hydro-cuprein* (hydroquinine) *hydrochloride* may prove useful. The narrow interval between the toxic dose and the therapeutic dose of *ethyl-hydrocuprein* (optochin), however, inhibits the general use of this drug and its salts at present, despite their high bactericidal power. Some modification of the molecule may remove this drawback, and is a worthy objective of experiment.

2. Pressor Agents. *Cocain hydrochloride, caffeine-sodio-salicylate, adrenalin, posterior-pituitary principle*—singly or in alternation or rotation—are used, *when necessary*, to maintain the line of *systolic blood-pressure* at or above the level of *pulse frequency*, as charted by Gibson's method. The *pituitary preparation* has the additional advantage of tending to prevent tympanites and dilatation of the stomach. Usually a precautionary injection of cocain (½ grain, 0·03 gm.) or posterior-pituitary solution (1 mil.) is made with the first injection of quinine, since the latter tends to lower blood-pressure slightly. It is repeated every third hour, or as needed. In some cases so many as sixty doses have been given. In others from three to ten. In some, none at all.

3. Cardiants. *Diastolic blood-pressure* and *respiration* are charted on the same vertical (imitating Gibson's pulse-systolic pressure ratio); and an interval of less than ten points is considered a signal of danger, perhaps calling for the use of *camphor* or *digitalis* in full doses. Sometimes both agents are employed. In the majority of cases, neither of these drugs becomes necessary. Digitalis effects can be obtained more readily when the patient is under the influence of quinine than in other cases. Concerning both pressor agents and cardiants, care is, of course, necessary not to exhaust by overstimulation. One is to be "bold, but not too bold" —nor too timid. *Oxygen* is sometimes helpful in overcoming this condition; not by direct effect on the heart apparently, but indirectly through its general action.

4. Auxiliary and Symptomatic Measures. *Wet cupping, dry cupping, venesection*, and the continuous or occasional use of *oxygen, alcohol, strychnine, atropine, opium, musk, creosotal ammonium carbonate* and other drugs are reserved for *special indications*, which may or may not be present in any given case. Cases calling for *early bleeding* are not often seen, but *late blood-letting* to relieve the right heart is occasionally called for, and may prevent death by pulmonary œdema, if done in time.

5. Roborant in Convalescence. *Tincture of ferric chloride*

is given when the quinine is withdrawn, and continued during convalescence.

6. Specific Stimulation. In prolonged cases with extensive lesions, in certain cases of tardy defervescence, and in all cases of delayed resolution after defervescence, a *personal bacterin* (so-called autogenous vaccine) is used in progressively increased amounts, with appropriate intervals (three to seven days) between doses. Repetitions and increases of dose are largely guided by the temperature and leukocyte reactions.

The early employment of bacterins has not seemed advisable or beneficial, though in a few cases it was tried and did no harm.

7. Iodin. Observations as to the value of iodin (in colloidal and other forms) as an adjuvant in cases with extensive lesions and tardy defervescence, are as yet too few to be conclusive, though on the whole they seem to indicate a favourable action.

8. Individualization. In all features of the treatment there must be careful *adjustment* of means and measures to the *special needs* of the *particular patient* at the *moment*. One must not only know when and how to use medicines; but also watch and know when to *withhold them*. All the measures mentioned are not to be applied in every case. In most cases but one or two will be needed; but in some cases at one period or another, several may be indicated and one must not fear to use them. Routine is inferior to discretion. Too much is worse than too little, but too little is not good. The aim is to be "just right".

Experimental

Clinical observation has emphasized on a large scale—not merely in isolated instances—two facts in regard to the action of quinine in the pneumonias: (1) The conversion of *defervescence* from crisis to lysis; and (2) the virtual absence of *cinchonism* under repeated doses, at times enormous, of an active cinchonic. Adding to these the invariable abatement—if not suppression—of toxæmic symptoms, the inference is natural that the drug acts as a *chemical antitoxic*. In other words, there seems to be *reciprocal neutralization* between the drug and something in the patient's body. Quinine overcomes the pneumonia poisons and the pneumonia poisons protect against quinine. This view is confirmed by the fact that despite the relief—sometimes wonderfully prompt and complete—to symptoms, the physical signs pursue the ordinary course, indicating that quinine does not affect in an appreciable degree either

the evolution or the involution of morbid tissue changes. Roentgen ray studies and autopsies show this to be the case. Also, the occurrence of pneumococcus empyema in a certain proportion of cases and the continued findings of viable pneumococci in the blood and sputum, seem to confirm the opinion that the greatest value of the drug *does not depend upon its germicidal* action.

These views have long been before the profession, but only recently has it been possible, through a generous subvention from Mr. Samuel Fels, of Philadelphia, to undertake experimental studies to test and determine the facts with reference to the three distinctive types of pneumococci.

These experiments are still in progress, and only one phase is ready for report; namely, that concerning the germicidal action upon pneumococci of the various drugs studied. In this work the author has been so fortunate as to secure the coöperation of Dr. John A. Kolmer, of the University of Pennsylvania, in whose laboratory, and under whose direct supervision the observations have been made, with the assistance of Dr. George D. Heist.

A detailed report will be published elsewhere (*Transactions Association of American Physicians*). For the present it may be stated that the research has been carried far enough to show a distinct germicidal influence *in vitro*, of all cinchona derivatives, upon the three distinctive types of pneumococci. Certain differences appear in the relative values of the various salts of quinine, all of which are much less potent than ethyl hydrocuprein, but all of which show dinstinct and high germicidal activity—not only inhibiting growth, but also killing the pneumococci of all three types observed (I, II, and III). Quantitative differences in the germicidal values of the different agents tested, with respect to the different types of pneumococci, have also been observed; but these are much slighter than were expected.

Cross observations with other germicides (*e.g.* mercuric chloride, phenol. and arsenobenzol) show that while these exert some bactericidal effect upon pneumococci it is insignificant in comparison with that of the quinine group. Similarly, while the cinchona derivatives not only inhibit the growth of other bacteria (*e.g.*, *Bacillus typhosus, Staphylococcus aureus*) but also destroy them, the concentration necessary is very many times greater than that fatal to pneumococci. It may thus be positively stated that the experiments show a distinctive relation (bacteriotropism) between cinchona derivatives and the three types of pneumococci. So far as *ethyl hydrocuprein* is concerned, these observations merely confirm

the work of previous observers (Fränkel, Morgenroth and Levy, Moore and others) signalizing this drug as the pneumococcus-slayer *par excellence*. Clinical studies, however, do not show the same superiority of ethyl hydrocuprein over quinine in the treatment of any type of pneumonia, even when the former is reinforced by a specific serum—and this, notwithstanding the fact that such reinforcement has been shown to increase its germicidal value enormously in experimental pneumococcus infection in rabbits. (Moore.)

Moreover, ethyl hydrocuprein is much more toxic than quinine, causing in laboratory studies upon normal animals much greater central depression of blood-pressure and earlier cardiac paralysis. (Smith and Fantus). A further fact to be noted in passing is that in the tests made in Dr. Kolmer's laboratory by Wright's method, *the proportional decrease of germicidal activity in serum* below that shown in salt solution is much greater for ethyl hydrocuprein than for the quinine salts.

Experiments *in vivo*, and especially the more important experiments concerning the relation of quinine and allied compounds to the pneumonia poisons, are not yet sufficiently advanced to be the subject of report. So far as they have gone, however, they tend to confirm the observations *in vitro*. Meanwhile parallel studies by other investigators are invited, for confirmation, correction or extension of the results, clinical and experimental, obtained at Philadelphia.

THE TRANSTHORACIC OPERATION FOR CHRONIC EMPYEMA AND FOR BRONCHIECTASIS

By F. N. G. Starr, M.B.

IT is now many years since I had as a patient in the Hospital for Sick Children, a little girl suffering from a most malignant form of osteomyelitis. During the progress of the disease she developed a pneumonia of the right lung, followed by abscess formation. One day, when examining the chest for "progress notes", I heard a "noise" through the stethoscope like an explosion, followed by a bubbling sound, and a marked alteration in the physical signs. Thinking that this meant rupture of the abscess, I put a needle into the eighth intercostal space and got pus. Under local anæsthesia I then made a small skin incision over the ninth space, and pulling this incision up to the level of the eighth space I thrust the knife into the pleural cavity, and, using the blade as a director, carried a drainage tube with a sinus forceps into the chest cavity. The knife was then withdrawn, and about 6 oz. of pus escaped. The tube fitted accurately and passed from without obliquely upward. When the patient inspired, the tube was open for drainage, and during expiration the tube closed and permitted the entrance of no air into the cavity. The drainage ceased in about ten days and the wound was allowed to close. I rather think that this is an instance of the most prompt treatment of empyema on record. The pus was evacuated from the pleura within fifteen minutes of its first appearance in the cavity. Mention of this case is made for three reasons:

First—one would rarely have to deal with old empyemata if the diagnosis were made early, and this, or similar treatment, such as goes by the name of "Holt" nowadays, were promptly adopted.

My second reason is,—to call attention to a possible causative factor, namely, that during the resolution of a pneumonia there is often a small, localized abscess, perhaps in an interlobular fissure, which may rupture into the pleural cavity.

Read at Surgical Section, Ontario Medical Association, June 2nd, 1916.
Received for publication June 5th, 1916.

The third reason is—that this same localized abscess, instead of rupturing into the cavity, may rupture into a bronchus, thus becoming the forerunner of a bronchiectasis.

If the empyema is an old one that has been treated as a slowly-resolving pneumonia for six or eight weeks after convalescence should have been well advanced, so that time has permitted a lung already damaged by pneumonia, to become collapsed, and adhesions between the visceral and parietal pleura to have occurred, then this treatment is hardly sufficient. The cavity should first be aspirated and the lung examined from day to day to estimate the amount of expansion that has occurred. After three or four days it is again aspirated. This may be done two or three times, in the hope that some expansion of the lung may occur. If one sees evidence of increased expansion one may put in a tube, to which is attached a Sprengel pump, or a siphon drainage, to see how much can be gained. Failing to get much expansion, the patient is prepared for radical treatment. He is put on his sound side on a table broken amidships, in order to get good extension of his damaged side. An incision is then made from the junction of the costal cartilage and the rib, parallel to the line of the rib, and close to the upper border back to the angle. The muscles are cut through down to the pleura and all bleeding stopped. The pleura is then incised throughout the length of the incision, the fingers inserted between the ribs, and the space stretched open, and a Balfour self-retaining, abdominal retractor is inserted, when one has complete command of the situation.

A suction tube is put in and any pus that has accumulated since the last tapping is evacuated. Large placques of lymph or fibrin are then removed; adhesions that exist between the parietal and visceral pleura are then divided, and the lung mobilized. During the process of mobilization one will likely find, and open, localized pockets of pus. The lobes are then carefully separated, when more pockets may be discovered. This all helps to provide for free drainage and for some expansion of the damaged lung.

At this stage of the operation one takes stock of the situation and carefully reassures himself that all bleeding points have been secured. A very sharp scalpel is then used to make linear incisions, preferably in a vertical direction, through the fibrinous coating of the pleura. In my limited experience there was very little bleeding, unless the lung tissue was entered, and this, so far, has not been serious.

I have been astonished when stripping these incised bands from

the surface of the lung, to see how quickly the expanding lung controls the hæmorrhage from these superficial wounds. Should the bleeding be severe, it might be safer to use the cautery knife for the linear cuts.

When several of these linear incisions have been made, one begins by peeling off each second strip, until the whole surface has been denuded.

The retractor having been removed, the muscles are then drawn together with catgut and the wound closed, except at its extreme posterior extremity. Here a drainage tube, *without lateral openings*, and long enough to reach to the bottom of the pleural cavity, is inserted. The reason for this is obvious. When the patient returns to bed a Sprengel pump is attached, and as soon as the patient feels fit he begins blowing water through a tube from one container to another.

In a bronchiectasis the same method of exploration may be followed. Upon locating the cavity, one may either attach the lung to the chest wall and drain, or he may dissect out the cavity. I have done both. The latter is a hazardous procedure at best, as for a few seconds the hæmorrhage is terrific, but I have been surprised to see how easily it is controlled by a few mattress sutures. These it is wiser to insert before the excision is done. Probably better still would be preliminary ligature of the branch of the pulmonary artery going to the particular lobe to be attacked.

In putting these few observations together I have purposely omitted much that might be said upon both subjects. My main object, however, besides calling attention to one of the newer procedures* is to elicit a free discussion, and thereby impress upon members the necessity of making an early diagnosis, when the treatment is simple.

While the operation is in progress it is well to give from 40 to 60 oz. of saline solution subcutaneously, to obviate shock. In the after care the patient may require one or two doses of morphine, or until all danger of shock has passed.

---

*Howard Lilienthal—*Trans. American Surgical Association*, 1915.

BLOOD TRANSFUSION IN HÆMORRHAGE OF THE NEWBORN

By Alan Brown, M.B.

Attending Physician Infants' Department, Hospital for Sick Children, and the Infants' Ward, Toronto General Hospital.

THERE are few diseases or conditions in infancy which have attracted more attention than the hæmorrhages which occur during the first two weeks of life. The enormous literature devoted to this subject consists in part of case reports and collected statistics bearing on the frequency, the etiology, and the treatment, and in part of investigations concerning the exact causation of the bleeding.

The anatomic lesions disclosed by post-mortem examination have been inconstant, and divergent views have been held by different observers concerning the causation of the hæmorrhage. The so-called hæmorrhagic disease of the newborn has been attributed to general diseases, inherited or acquired; to birth injuries; to mechanical causes; and to primary defects or alterations of the blood or vessels. Within the last few years there have been a number of important investigations on the physiology of the blood, and on the etiology and treatment of various hæmorrhagic conditions.

The frequency with which spontaneous hæmorrhage occurs in the newborn varies in the experience of different observers. According to Silvermann there were thirty-seven cases of gastro-enteric hæmorrhage in a total of 29,333 births; Kling recorded seventeen cases in 13,000 births. Winckel, Gerhardt and Rebemont, state that umbilical hæmorrhage occurs once for each 5,000 births. Nohl cites a ratio of one case to 1,816 births. In the Infants' Ward at the Toronto General Hospital there has been but one case in 1,200 births.

Before dealing with the therapeutic measures in this disease, it would not be amiss to review briefly the various theories as to the etiology. During the earlier period of investigation the so-

Read at the Annual Meeting of the Ontario Medical Association, June 1st, 1916.
Received for publication, June 27th, 1916.

called hæmorrhagic disease was ascribed to widely varying causes. Among these are, asphyxia from prolonged labour, general plethora, congestion of the mesenteric arteries, respiratory embarrassment, vascular thrombosis, rupture of blood-vessels, irritation due to swallowed amniotic fluid, and too early ligation of the umbilical cord. By many of the older authors hæmophilia was considered an important cause but we know now that hæmophilia is not manifested in the newborn..

It has long been recognized that many infectious diseases may present hæmorrhagic types and there is considerable evidence to show that bacterial infection may be responsible for hæmorrhage in the newborn. This evidence is of both clinical and bacteriologic nature. The results of the bacteriologic studies have been very inconstant, the pus cocci, the colon bacillus, typhoid bacillus, bacillus enteritis, bacillus lactis ærogenes, the diptheria bacillus, the bacilli hæmorrhagica of Kolb, the pneumococcus, the pneumobacillus of Friedlander, and several unclassified organisms have been recovered, either single or in combination from the bodies of infants who had hæmorrhage during life. It is therefore seen that no specific organisms have been discovered. The multiplicity of organisms, and the comparative infrequency with which different observers have isolated the same bacteria—excepting perhaps the pus cocci—merely indicate that hæmorrhage in the newborn may occur during the course of bacterial infection. Hæmorrhage due to syphilis alone probably does not occur, the luetic infection predisposes to bacterial invasion which results in hæmorrhage. Among the less frequent causes may be mentioned local lesions. such as gastric or intestinal ulceration, which it must be admitted are indeed most rare.

In addition to the above mentioned etiological factors the ultimate cause of the uncontrollable hæmorrhage is to be sought in some abnormal condition of the blood. Recent observations show that there is a clinical type of spontaneous hæmorrhage in the newborn infants for which no definite etiologic agent has been established. From the evidence available at present it seems only rational to suppose that the persistent hæmorrhage is directly dependent on some biochemical blood defect or change. But whether an abnormality of the blood or vessels is the primary etiologic factor, or whether the hæmorrhage is always secondary to some infection or disease, can only be determined by future investigation. Thus far researches into the biochemical nature of the affection have failed to throw any light on the subject.

Mortality

The mortality in the hæmorrhagic conditions of the newborn ranges from 35 per cent. to 87 per cent. In the collective cases of Townsend the mortality was 79 per cent.; in those of Silvermann, 56 per cent. In cases of gastro intestinal hæmorrhage Shukowsky observed a mortality of 62 per cent., while in the collective statistics of Vasmer the mortality was 32·8 per cent. In umbilical hæmorrhage the mortality observed was from 68 per cent. to 100 per cent.

Treatment

The futility of most therapeutic measures in the hæmorrhagic disease of the newborn is shown by the high mortality. Recently, however, several measures have been advocated which have given more promising results.

The use of calcium salts to control the hæmorrhage has been generally disappointing; it is true isolated cases have recovered but in the greater number the medication has been without effect. Judging from the reports of continental writers the administration of gelatin is of great value. Since its introduction in 1899 a number of favourable cases have been reported, such as a mortality of only 8·8 per cent. in one hundred and sixty-nine cases. In contrast to this, Shukowsky's series of cases indicate that the results are not all that might be desired.

In addition to these, many other preparations have been used with but little success. Following the publication of Weil, animal blood sera have been used for the treatment of hæmorrhage in the newborn. Judging from recent publications the most promising line of treatment, exclusive of transfusion, is by means of human blood or its derivatives. In 1910, Welch reported twelve cases of hæmorrhage in the newborn successfully treated by subcutaneous injections of human blood serum. A number of the patients suffered from severe hæmorrhage, and the treatment was followed by immediate improvement. Schloss and Commiskey treated seven infants with hæmorrhage by means of subcutaneous injections of human blood with but one fatality. The blood was taken from one or other of the parents and injected before coagulation into the subcutaneous tissues. In every case the blood was entirely absorbed within a few hours, and so far as could be determined, had no bad influence on the patient's general condition. The subcutaneous injection of whole blood is not without hypothetic objections. The formed elements possibly act as foreign material and

must be broken up and excreted. In only two instances have we used this procedure in both of which the result was most satisfactory.

It is always hazardous to draw conclusions from small series of cases, and this danger is very real in reference to the treatment of the hæmorrhagic conditions of the newborn. The hæmorrhages are of varying severity and are due to a still undecided etiology, probably some of the cases recover spontaneously, and this is indicated by the number of therapeutic measures which have given favourable results in isolated cases. The true value of any therapeutic agent can be judged only by a large series of cases.

The great theoretical and practical objection to all these methods is the fact that the hæmorrhage is stopped but the amount of blood lost is not replaced, and while admitting this may not be of decided import in many cases when the hæmorrhage is small it is of vital importance when the amount of blood lost is large and the infant almost exsanguinated. In my own experience I am cognisant of two cases where initial transfusion would have prevented later trouble. In one instance after a moderate hæmorrhage a severe degree of atrophy or marasmus set in and in another the child had suffered from chronic indigestion for almost a year which promptly vanished after blood transfusion; if the transfusion had been performed in the initial stage, it is reasonable to assume that neither of these lives would have been jeopardized.

Infants are susceptible to the effects of hæmorrhage. A baby of eight pounds is estimated to have a total quantity of a little more than eight ounces. Since a dog cannot always survive a loss of one half the total quantity of blood it is fair to assume that the loss of an exsanguinated infant is about one half the total quantity. Thus I feel, in dealing with hæmorrhagic disease of the newborn, it is not safe to temporize too long with measures which may check the bleeding but cannot relieve the anæmia. Hence the advantage of transfusion over serum injections.

Embolism, sepsis, the transmission of disease, and even hæmolysis are of much less frequent occurrence than was formerly supposed. The danger of hæmolysis has been exaggerated by most writers. Crile says that "Kinship between donor and recipient is apparently of no special advantage and the laboratory test may show hæmolysis and yet the same blood be entirely safe in transfusion." In only one of our series was a hæmolysis test

made and that was positive, but absolutely no evidence of blood destruction was observed following transfusion.

Properly safeguarded transfusion is not a dangerous operation. The withdrawal of too much blood from the donor and the dilation of the recipient's heart are usually avoidable mishaps. The introduction of air bubbles both large and small, contrary to the general opinion have caused absolutely no harm. Experimentally this observation has been confined by Bruce Robertson when almost a syringeful (10 c.c.) of air was introduced into a dog's femoral vein producing only a momentary cyanosis and then complete recovery with apparently no bad after-effects.

The amount transfused may be controlled to a certain extent by the estimation of the hæmoglobin, but it must be borne in mind that the introduction of whole blood acts as a stimulus to the hæmatopœtic organs, with a result that from twelve to fourteen hours following the cessation of transfusion the hæmoglobin may read from ten to thirty points higher. In newborn infants from 90 to 120 c.c. is sufficient to stop the bleeding and restore almost the total quantity of blood or approximately 15 c.c. for every pound of body weight.

Though the operation of blood transfusion is by no means a new one, it has taken many years to reach the present varieties of technique and by no means has the last word on it been said, as is evidenced by the overwhelming number of articles appearing in the current literature describing various forms of apparatus and methods of technique. In a paper such as this it would be impossible to refer to the numerous procedures except to record the fact that Dr. Unger's apparatus is credited with giving the greatest satisfaction in adult work.

The technique employed by us is, with certain modifications, the Von Ziemssen method as revived and improved by Lindemann, of New York. The instruments used are a set of six 20 c.c. ground glass syringes, two luer needles, one of small and the other large bore, which have smooth unbevelled tips, a set of small dissecting instruments and a pair of curved foreign-body forceps, such as are used in eye work. All instruments are sterilized by boiling and the syringes and needles are lubricated on the inside by washing through them sterilized liquid paraffin. The following detail applies to the procedure as carried out.

Having sterilized the skin by painting with 2·5 per cent. tincture of iodine, select the most superficial vein in the antecubital region of the recipient's left arm, anæsthetize the skin with a 0·5

per cent. novocaine solution, and apply constriction, just below the shoulder sufficient to prevent the venous return. With fine dissecting instruments expose and free the vein for a distance of half an inch, ligate it at the distal end of the wound and release the tourniquet. At the point in the vein selected for the entrance of the needle make an oblique opening into the lumen of the vessel—if the lumen is too small to admit the needle, dilate the vessel by introducing a fine pair of curved foreign body forceps such as used in eye work. Tie the needle to the vein and allow it to fill with blood. A saline syringe is now attached and a small quantity of salt solution injected to clear the needle of blood.

When the recipient's vein has been entered, a needle is introduced into an elbow vein of the donor and a syringe attached. If the needle is introduced in a direction opposite to that of the blood stream, it will be found that the syringe as a rule will fill more quickly, particularly if moderate constriction is applied above the elbow as the piston of the syringe is being drawn out.

As soon as the assistant has obtained 20 c.c. of blood from the donor the blood-filled syringe is passed to the operator who substitutes it for the saline syringe previously attached to the recipient's needle. The injection of blood is made at a moderate rate of speed, and as soon as the syringe is emptied it is immediately replaced by a saline syringe and sufficient salt solution injected to clear the needle of blood. In the case of the donor a saline syringe is attached and needle cleared in the intervals between the successive withdrawals of blood. The time required for filling and emptying a 20 c.c. syringe in this manner should not occupy more than fifteen seconds. The blood may be injected at the rate of 20 c.c. to the minute. In one of our cases in which the weight was only four pounds and the general condition was very poor, the injection of blood was carried out too rapidly for the accommodation of the circulation, and the patient showed signs of sudden overdistension of the right heart and pulmonary circulation and died in spite of attempted withdrawals of blood both from vein and heart.

The chief difficulty to be encountered in the cases with plenty of subcutaneous fat is in defining and introducing a needle into the vein but very little experience enables one to incise directly over the vein while a little separation of the tissues with artery forceps readily reveals the vessel. Following transfusion it is quite usual to see an abrupt rise in the pulse rate and possibly some irregularity. A rigour may or may not accompany the temperature rise,

but does not last long and the temperature subsides wthin a few hours.

As compared with the method of direct transfusion the syringe cannula method is very much simpler, as a much greater degree of control is obtained and the exact amount of blood is known. In comparison with these methods in which large receptacles are used for the transfusion of blood it has the advantage that the blood may be introduced slowly, intermittently, and in very small quantities, while in the large receptacles the apparatus is less easily manipulated and if clotting occurs a great part of the blood may be lost. Most certainly in hæmorrhagic disease which of course occurs only in young infants, its ease of application should recommend it as the method of choice.

The following is a brief synopsis of the series: In all there were fourteen cases with thirteen recoveries or a mortality of but 8·2 per cent. which might be considered most encouraging when one takes into consideration that of the fourteen cases nine were considered to be almost moribund or completely exsanguinated. The one fatal case was an infant three days old, weighing four pounds, suffering from multiple and extensive subcutaneous hæmorrhages, since the first day of birth. On examination the child was found to be well nourished but dehydrated and covered with extensive extravasations of blood. The infant was immediately transfused with 160 c.c. of father's blood and two hours later succumbed to a mechanical death, the symptoms being dyspnœa, aphonia and cyanosis. Autopsy revealed overdistension of the right heart, rupture of the lung capillaries and bloody fluid in the pleural cavity. Here it will be observed the amount of blood given was approximately 20 c.c. to the kilogram or a little over twice the usual amount. The patient we feel would have been saved had a smaller amount of blood been injected.

The following facts will serve to illustrate the type of case we had to deal with better than a synopsis of each case. Twelve suffered from gastro-intestinal hæmorrhage and two from extensive subcutaneous extravasations. The average duration of hæmorrhages was two and one half days. Nine were prostrated or almost completely exsanguinated, the lowest weight was four pounds and the average weight seven pounds two ounces. The lowest blood count was 10 per cent. hæmoglobin and 900,000 red cells, the highest hæmoglobin being 65 per cent. The average amount transfused was 88 c.c. or approximately 13 c.c. per pound of body

weight; probably 15 c.c. per pound of body weight would be a good average.

The benefical effect of transfusion is immediate—it stops the bleeding, restores the lost blood, and transforms a sick and often dying child into a normal healthy infant.

The following more detailed description illustrates the usual course of events.

Case. 1. Age one and a half days; admitted for intestinal hæmorrhage, since twelve hours after birth. The family physician stated that the "infant must have lost six ounces of blood". Within three hours after admission the infant passed three large bloody motions. Tranfused three hours after admission, 90 c.c. of father's blood being injected. The red cells were 2,400,000 before transfusion, 4,700,000 directly after transfusion, and 6,400,000 fourteen hours later, showing the stimulating effect of the injected blood. Discharged the following day. Two months later the red blood cells were 4,800,000. Following transfusion another stool was passed showing no macroscopic blood.

Remarks

Transfusion is a safe and not complicated procedure and is to be recommended as the procedure in all cases of hæmorrhage of the newborn, for so far we are unable to judge the rapidity of hæmorrhage, and death has been known to take place in three hours following large extravasations. Other methods recommended may stop the hæmorrhage but they do not give the infant the same chance for immediate progress.

The danger from hæmolysis is overrated, and the injection of small air bubbles in our experience has created no ill effects.

Fifteen cubic centimetres per pound of body weight may be considered a safe amount to inject, which will approximately restore the amount of lost blood and stop the hæmorrhage.

In conclusion I wish to extend my thanks and appreciation to Drs. McKilwraith, Noble, and Hanley of Toronto who kindly referred the cases to me.

Case Reports

PRURITIS IN ORAL SEPSIS

By Dr. G. W. Smith,

North Bay, Ont.

SHORTLY before Christmas of last year, I was consulted by a gentleman whose sole complaint was of an itching in the skin. The itching would occur on any portion of the body, but was generally worst on the flexor surfaces of the upper and lower extremities and across the chest. It might occur any time during the day but was invariably worse when undressing at night and after getting in to bed. He was a commercial traveller by occupation, and while his home was in one of our larger cities, his territory lay within Northern Ontario. He could scarcely sleep at night, and in almost every place where he would stop over night he would have to go to a local physician to try to obtain something to enable him to sleep. He had followed out various lines of treatment without improvement. He called at my office one evening on his usual errand to get something to make him sleep. The most careful examination of the skin did not disclose any lesions except those produced by scratching, he was most particular about his person and his clothes. Did not use liquors or drugs, but did use tobacco moderately. The urine did not show sugar or albumen. I had about despaired of diagnosing his case until I examined the mouth, here was found a most septic condition, several roots and several teeth in various stages of decay, and the gums everywhere in a septic state. For one who was so particular in other ways it was rather disappointing to find the mouth and teeth so neglected. I advised him to consult his dentist upon returning home for his Christmas holidays, and in the meantime prescribed an antiseptic mouth wash and spoke to him of the necessity of keeping his teeth in a better condition. About two months afterwards he returned on his rounds and called me up on the telephone to say he was completely cured. Asked what treatment he had taken he replied none but what I had advised. A number of roots and teeth had

Received for publication May 22nd, 1916.

been extracted and he had followed faithfully the directions to keep the mouth clean. Here then is a case of pruritus due apparently to an absorption of septic material from the mouth, some septic matter being no doubt in part absorbed directly from the gums and more in all probability swallowed with the food, producing an altered condition of the blood manifesting itself by a general pruritus. In view of the attention which oral sepsis is attracting in our day it appeared to me that this case would add to the numbers already accumulating to show the importance of this condition.

A TRAINING school for nurses is to be established at the Vancouver General Hospital. A committee was appointed at a recent meeting of the board of directors to draft the rules and regulations and the following members of the board of management were elected: Messrs. J. J. Banfield, G. H. Cottrell, and H. T. Devine, representing the hospital executive board; Dr. C. H. Gatewood, house committee; Dr. J. M. Pearson, representing the medical profession of the city; the general superintendent, the lady superintendent, and the managing secretary of the hospital.

Editorial

THE SURGICAL ASPECTS OF THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS

THE triennial gathering of the several societies of surgeons, physicians, and specialists at Washington has grown to be regarded as a great institution. This large joint meeting has become, especially in recent years, a pronounced success. The several societies, both in their individual and joint meetings, act and interact upon one another, and in this interaction derive mutual stimulus and fellowship.

The American Surgical Association is one of the most active associations. The papers presented at each meeting reflect the progress made during the year preceding and in a measure forecast the advancements to be anticipated.

The last annual meeting held in Washington was no exception to the rule. The papers were prepared with unusual care and in many cases marked milestones in the advancement of surgery in America.

To the writer there were three distinct features that gave it a special character and by which it will always be remembered.

The address of the president, Dr. Robert G. Leconte, was very largely devoted to the great subject of preparedness. It was a clarion call to the profession of the United States to greater interest and immediate action in preparing by organization for efficient medical service in the army and navy. He made the startling statement that in the Spanish-American War a soldier's life was ten times safer in the firing line than in the training camps. He proceeded to demonstrate the value to the country, and to the army and navy the importance of a competent and highly trained army medical service. He

urged upon the members the value of scientific medicine in the army and navy.

The address was received with great enthusiasm and indications of approval.

The second distinctive feature was the number of papers dealing with wounds and their treatment. Added interest was contributed to the discussion by some of the veterans of the Civil War, notably Dr. Keen, Dr. Mears and Dr. Van de Veer. The newer pathology, bacteriology and the present principle governing the treatment of wounds were contrasted with the ideas and theories that obtained half a century ago. The discussion brought very clearly into light the progress achieved by surgery during the past fifty years.

The third was a striking and sad feature, viz., the absence of overseas surgeons. At these annual meetings there have usually been several representative surgeons from England and Scotland, France, Italy, and the enemy and neutral countries who have brought with them the latest thought of the older civilizations and contributed in no small degree to the interest of the meeting. A day dreamer could not but wonder when, if ever, the kindly and friendly international fellowship of surgeons that obtained prior to the war would be resumed.

The relation of surgery to war was never more intimate, and never more intelligently appreciated both by the combatant and the non-combatant.

The meeting of the American Gynecological Society was certainly one of the best held in recent years. The papers presented were of exceptional quality.

The outstanding feature was the symposium on Syphilis. For the first time in its history the society introduced the plan of publishing before the meeting a full text on the main papers presented at this symposium. These papers or *referats* were bound together and were issued to the members of the society a month before the meeting. In this way it was possible for every member of the society to acquaint himself

beforehand with the actual paper of the symposium; he could accordingly collate his own clinical material, crystallize his experience, before he attended the meeting. At the meeting these papers were not presented in full. Instead their respective authors simply reviewed them in a short fifteen-minute address.

These papers were all of marked excellence. The one, perhaps, of most general interest was that of Sigmund Pollitzer, of New York City, on "Syphilis in relation to some social problems". The study of "Syphilis of the internal genital organs of the female", by George Gellhorn and Hugo Ehrenfest will remain for many years a monograph on the subject.

The marked feature of the experiment was the great improvement in the subsequent discussion. It was really a matter of astonishment to hear over and over again how much a speaker would say in his allotted five minutes.

The concensus of opinion seemed to be that the experiment of the published *referat* would be continued.

A second symposium was held on Uterine Cancer and its Treatment. The picture of uterine cancer as it was painted was certainly sombre enough. An animated discussion centred round the use of low heat as advocated by Percy. The exponents of this method, in the opinion of the writer, failed to make good their claim for the method as a curative agent. We are, I think, rather to regard it as a palliative method, certainly in cases that are at all advanced. Moreover, the method was shown to be not without its dangers.

More and more emphatic became the pronouncement that our only hope in the successful treatment of uterine cancer is in the early recognition of the disease. The disease once recognized is to be completely removed; preferably, perhaps, by the hot knife, as advocated long ago by Byrne, and lately re-emphasized by Werder and Boldt.

The question of prophylaxis in the matter of relief of irritation and repairs of lacerations was rightly enough given distinct prominence.

THE LANGE COLLOIDAL GOLD TEST

SINCE the publication, in 1912, of Lange's work on the precipitation of colloidal gold by proteids, in the presence of a weak solution of an electrolyte like sodium chloride, and his application of the method to the study of the cerebro-spinal fluid in syphilis, several articles have appeared on the value of the test in syphilis of the nervous system. From the investigations of Lange, Grulee and Moody, Lee and Hinton, and others we now know that the goldsol test is a reliable confirmatory test in the diagnosis of general paralysis, and that it is of greater value than the Wassermann test, applied to the cerebro-spinal fluid, in the diagnosis of tabes. We must not infer from this that the test is to be employed to the exclusion of other methods of investigation of spinal fluid in syphilis. It is a valuable addition to the laboratory methods of the serologist, because of its delicacy and the sharpness of its reactions. Little material is needed for the test.

Too much emphasis cannot be laid on absolute cleanliness in performing the test, and the method of Lange, as described by Grulee and Moody, should be faithfully followed. Moreover, as emphasized by Ramsay and Fidlar in their article in this issue, the sensitiveness of the colloidal gold should be previously tested against cerebro-spinal fluid from a case of general paralysis, before employing the reagent in actual tests.

The value of the Lange test, as an indication of the efficacy of treatment, is undoubted.

THE CANADIAN RED CROSS SOCIETY

IN the eighth annual report of the proceedings of the Canadian Red Cross Society the work of the year 1915 is divided into three sections,—the work in Canada, the work in England, and the active assistance given by the society

in the several war zones through its commissioners in coöperation with the British Red Cross Society.

Three hundred branches of the Society have been established during the year under consideration, making the total number of branches four hundred and eighty-four. A large number of auxiliary societies have also been founded in places where the population is too small to warrant the establishment of regular branches of the society. With a view to encouraging the formation of such branches organizers and speakers have been sent to rural districts to explain the objects of the Society and their efforts have proved most successful. The enormous correspondence entailed by the establishment of so many centres of activity has been reduced to some extent by the publication of a monthly bulletin containing information and instruction on matters relating to the work of the Society, and by the distribution of pamphlets entitled "Suggestions for work", of which about two hundred thousand copies have been sent out, and "War work".

An information bureau has been established by Mr. Hugh Langton, the librarian of Toronto University, for the purpose of answering enquiries as to the condition and progress of disabled Canadian soldiers.

In England, the Duchess of Connaught Canadian Red Cross Hospital has been established at Cliveden and provides accommodation for nine hundred patients; it is under the command of Colonel Gorrell, C.A.M.C., of Ottawa. The King's Canadian Red Cross Hospital at Bushey Park has accommodation for three hundred patients, and the Peak Hydro, at Buxton, Derbyshire, has been taken over by the Society, and converted into the Canadian Medical Services Special Hospital for Rheumatism. In addition the Daughters of the Empire Canadian Red Cross Hospital has been opened at Hyde Park Place, London, for the reception of Canadian officers and has accommodation for about forty patients. The cost of equipment and necessary alterations for this hospital was borne by Colonel and Mrs. Gooderham, of Toronto,

and its maintenance has been undertaken by the Canadian Militia Department.

The Society has given material assistance to a number of hospitals and other institutions in England and France and to the military hospitals established in this country.

Since November, 1914, Colonel C. A. Hodgetts, C.A.M.C., of Toronto, has acted as Commissioner to the Society in England. The position of the Society in France has been clearly defined as a branch of the British Red Cross Society and the work there has been under the direction of the Assistant Commissioner, Captain H. W. Blaylock, assisted by Captain G. W. Bridges. Most of the supplies are kept at Boulogne, but advanced depots have been established with each of the Canadian General Hospitals. During the year seventy-eight Red Cross nurses were sent to England by the Society and are now on duty in various hospitals in England, France, and the Mediterranean; and from November, 1914, to the end of 1915, no less than fifty-six ambulances were placed at the disposition of the Canadian Army Medical Corps. The splendid work accomplished by Lady Drummond in collecting information about wounded and invalided Canadian soldiers is well known. The Prisoners of War Department, which is under the direction of Mrs. Rivers Bulkeley, is an outgrowth of the Information Department. Weekly parcels of bread, and fortnightly parcels of other food, and clothes as required, are sent to each prisoner and if no special funds are available for this purpose, the general funds of the Red Cross are used to defray the expenses.

Mr. T. B. Kidner, vocational secretary of the Military Hospitals Commission, recently made a tour through the western provinces to organize vocational training for returned soldiers who are unable to resume their former occupations. Vocational officers have been appointed in Manitoba, Saskatchewan, Alberta, and British Columbia, and the services

of technical educational experts have been secured in each province. Arrangements have been made for instruction in general subjects, arts and crafts, at the convalescent homes at Winnipeg, Regina, Calgary, and Victoria. The people of Edmonton are very desirous of having a convalescent home established there. The matter was brought up at a dinner given on May 31st, in honour of Dr. W. Boyd, R.A.M.C., professor of pathology in the University of Manitoba, Captain H. L. Collins, C.A.M.C., and Captain Evan Greene, C.A.M.C., who have returned from the front. The following resolution was passed on the motion of Captain Collins, seconded by Dr. T. H. Whitelaw: "That in the opinion of the members of the Academy of Medicine here assembled it is necessary and essential that an "Open Unit" or casualty assembly corps be established in Edmonton for taking care of wounded soldiers from overseas and also of men awaiting discharge from the units in Alberta." The president of the Academy, Dr. Edgar Allin, paid a tribute to those members of the profession—35 in number—who have gone to the front from the province of Alberta, mentioning particularly the late Captain Monkman, C.A.M.C., who was killed in action last December.

THE case report published on page 724 of this issue shows the close connexion that exists between general health and the condition of the mouth and teeth, and as this becomes more generally understood, more attention is being paid to the condition of the teeth of children attending the public schools. Some kind of inspection is now made in most schools, but Toronto seems to have been the first place in this country to establish a dental clinic. The combined efforts of the Oral Hygiene Committee of Toronto Dentists and the Ontario Dental Society resulted in the appointment of one dental surgeon four years ago. To-day there are fifteen centres with a dentist in charge of each, and, as a consequence

of the work accomplished at these clinics, the number of dental defectives found amongst 49,081 children examined has fallen from 95 to 65 per cent. The importance of keeping the mouth clean is impressed upon the children, who are taught to wash the mouth out well with water and to expel the water through the teeth. Marks are given for clean mouths and a spirit of competition is encouraged; and the interest of the children is awakened by the exhibition of slides and plaster casts to show malformation of teeth and jaws caused by neglect.

In New York it has been decided to employ dental nurses, whose duty it will be to remove lime deposits, accretions, and stains from the exposed surfaces of the teeth. The work will be done in the schools, in the office of a licensed dentist, or in any public institution , but only under the supervision of a qualified dentist. In order to prevent untrained persons from following the calling of dental hygienist, a bill was recently passed by the Legislature to provide for the establishment at any dental dispensary or infirmary legally incorporated and registered, and maintaining a proper standard and equipment, of a course of study in oral hygiene for women students. The course will cover one year's study, at the end of which time students will graduate as dental hygienists. Similar laws have been passed in Massachusetts and Connecticut.

THE second bulletin of the Military Hospitals Commission has now been issued. It contains a list of the Convalescent Hospitals established in various parts of the Dominion and an account of the work of the Provincial Commissions, together with the personnel. Explanatory charts are appended showing the exact procedure from the battlefield to final rehabilitation in Canada of wounded and invalided members of the Canadian Expeditionary Force. A special orthopædic centre has been established in Toronto and all those who require artificial limbs are sent there direct from the port of disembarkation. A workshop for the manufacture

of artificial limbs will be established shortly, and it is proposed, as far as possible, to utilize the services of returned men in the manufacture of these limbs. By undertaking the manufacture of artificial limbs the Commission will be able to make use of the latest improvements, some of which would not be available to individual firms. Fortunately, very few Canadian soldiers have become totally blind, four only having returned to Canada up to June 16th, last. Those who have lost their sight are first given instruction at the St. Dunstan's Home for Blinded Soldiers, London, and after a period of training return to Canada. Arrangements have been made with the Canadian Free Library for the Blind to furnish books and other literature to these men and, if necessary, on arrival in Canada they will be sent for further treatment to one of the Blind Institutes already established in this country. Those who have lost an eye are provided with a glass eye by the Canadian medical authorities in England.

Dr. A. Thompson, member of Parliament for the Yukon, has been appointed medical superintendent of the Commission, with the military rank of Lieutenant-Colonel, and the following gentlemen have been added to the personnel of the Commission, Dr. Francis J. Shepherd, of Montreal; F. W. Peters, Esq., of Vancouver, and Robert Gill, Esq., of Ottawa.

Arrangements have been made for the training of members of the Expeditionary Force who are unable, through disability, to resume their former occupations, and classes have been commenced at some of the Convalescent Homes where instruction is given in penmanship, business English, practical arithmetic, mechanical drawing, woodworking, correspondence, and, in a few special instances, steam engineering and automobile engineering. The following vocational officers have been appointed: Quebec and the Maritime Provinces,—Mr. F. H. Sexton, director of technical education for Nova Scotia; Manitoba,—Mr. J. C. Warters, director of technical education for Winnipeg; Alberta,—Mr. J. C. Miller, director of technical education for Alberta; British Columbia,—Mr. John Kyle, organizer of technical education

for British Columbia; Saskatchewan,—Mr. H. W. Hewitt, supervisor of manual arts, Saskatoon.

PROFESSOR LANNELONGUE, of the Paris College of Medicine, laid before the Senate, in 1910, a Bill directed against depopulation, which led to a governmental study of the question. A report by M. E. Henry, a member of the *Chambre de Commerce*, has now been made public. It states that during the period from 1903 to 1913 the number of births was slightly in excess of the number of deaths with exception of the year 1907 when the excess of deaths was about 19,071, and the year 1911 when the deaths exceeded the births by 34,869. In the year 1903 the number of births exceeded the number of deaths by 73,016. The war has made only too apparent the great importance of this matter, particularly when one remembers that in Germany the excess of births over deaths varies from 740,000 to 910,000, and in Austria from 237,000 to 342,000. The conclusions of the report prepared by M. Henry have been adopted by the *Chambre de Commerce* and are as follow: that the resources of literature, art, and the press be utilized to inform the nation of the grave peril which the lowering of the birth rate produces in France and to encourage ideas and customs necessary to combat this lowered birth rate; that parliament introduce as soon as possible, the judicial, administrative, fiscal, and financial reforms necessary to check depopulation and especially that the various problems outlined to the Senate in Professor Lannelongue's report be studied and the remedies applied without delay; that the laws on the employment of apprentices in shops where adults are employed be revised; that a study be made of measures to combat alcoholism, and the necessary laws passed; that the aid given to large families cease to be regarded as charity and be sufficiently increased to be a substantial encouragement to those who have added to the riches of the country by building up families.

In the report submitted by Professor Lannelongue in 1910, the following were mentioned as the principal reasons

for the reduction in the number of births: prolonged or perpetual celibacy, late marriage, the excessive tendency to seek official life, the lack of testamentary liberty, the precarious situation of the salaried official, rural emigration. As remedial measures, Dr. Lannelongue proposed that supplementary military obligations should be laid upon celibates of more than twenty-nine years of age; that marriage should be required of all civil officials above the age of twenty-five years; that civil employees who have not less than three living children should be given certain pecuniary advantages, both during service and upon retirement; and that a father of a family should have absolute liberty in disposing of his patrimony.

Some idea of the effects of the war upon the birth rate of France will be gathered from the following figures, quoted in a recent issue of the *British Medical Journal*. During 1914, the number of infants eligible for vaccination within a certain area in France was 104; in 1915, in the same area, the number was 57, and in 1916 only 32. The birth rate in one town fell from 173 in 1913 to 86 in 1915. Basing calculations upon these figures and taking the annual birth rate of France as 775,000, the decrease in the number of births this year would be not less than 541,000. To this must be added the loss of life on the battlefield and the increased death rate among the civil population caused by unfavourable conditions, such as under-nourishment of infants, lack of medical attention and overwork amongst women.

The effects of the war upon the population of England were discussed at a meeting of the Royal Statistical Society on May 16th, when Mr. J. W. Nixon stated that the death rate in England had not as yet been very seriously affected, that the theory advanced early in the war that the proportion of male births had been increased was found to be groundless, and that the natural increase of population had fallen from 377,000 in 1913 to 252,000 in 1915 exclusive of deaths of soldiers abroad.

A TELEGRAM has been received by Mr. A. B. Wiswell, of Halifax, informing him that his son Captain Gordon Wiswell, M.D., C.M., has been awarded the Military Cross.

Captain Wiswell attended to the wounded in the recent fighting in France for five days and nights without sleep and with almost no food, all the time within the range of shells and machine guns. He came through this dreadful ordeal unwounded.

Gordon Wiswell, who is a graduate in Arts and in Medicine, of Dalhousie University, was a noted athlete in his time, equally proficient as a football player and a player of ice-hockey.

It is understood that Captain Wiswell will be decorated by His Majesty personally.

THE joint committee representing Dalhousie University and the Nova Scotia Medical Society upon the Copwell Library and Library of the Faculty of Medicine of Dalhousie University held its first meeting on July 13th.

It was decided to proceed at once with the classifying of the books and the preparation of a catalogue. A librarian has already begun work. The committee has sent out a request addressed to all the medical practitioners in Nova Scotia for gifts of books, manuscripts, old and rare texts, documents bearing on the history of the profession, portraits and photographs of noted physicians, or any object which should have a place in a medical library. Gifts from any alumini of Dalhousie University will be very much appreciated.

Miscellany

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

MANUAL OF OPERATIVE SURGERY. By JOHN FAIRBAIRN BINNIE, A.M., C.M., F.A.C.S., surgeon of the Christian Church, the German and the General hospitals, Kansas City. Seventh edition, revised and enlarged. 1,363 pages with 1,597 illustrations. Publishers: P. Blakiston's Son & Company, 1012 Walnut Street, Philadelphia. Price, $7.50 net.

THE PATHOLOGY OF TUMOURS. By E. H. KETTLE, M.D., B.S., assistant pathologist, St. Mary's Hospital. 224 pages with 126 illustrations. Publishers: H. K. Lewis & Company, Limited, 136 Gower Street, London, W.C., 1916. Price, 10s. 6d. net.

ANNALES DE LA CLINIQUE CHIRURGICALE DU PROFESSEUR PIERRE DELBET. No. 4, LE THORAX ET L'EMPHYSEME LA CHONDRECTOMIE. Par EUGENE DOUAY, aide d'anatomie à la Faculté de médecine de Paris. Avec 111 figures dans le texte. Paris, Librairie Félix Alcan, 108 Boulevard Saint-Germain, 1914. Prix: 20 francs.

A TEXT-BOOK OF FRACTURES AND DISLOCATIONS, WITH SPECIAL REFERENCE TO THEIR PATHOLOGY, DIAGNOSIS AND TREATMENT. By KELLOGG SPEED, S.B., M.D., F.A.C.S., associate in surgery, Northwestern University Medical School; associate surgeon, Mercy Hospital; attending surgeon, Cook County and Provident Hospitals, Chicago, Ill. Octavo, 888 pages, with 656 engravings. Cloth, $6.00, net. Lea & Febiger, publishers, Philadelphia and New York, 1916.

THE MORTALITY FROM CANCER THROUGHOUT THE WORLD. By FREDERICK L. HOFFMAN, LL.D., F.S.S., F.A.S.A., statistician to the Prudential Insurance Company of America. Newark, New Jersey: The Prudential Press, 1915.

LATERAL CURVATURE OF THE SPINE AND ROUND SHOULDERS. By ROBERT W. LOVETT, M.D. Third edition, revised and enlarged. 213 pages, with 180 illustrations. Publishers: Blakiston's Son & Company, 1012 Walnut Street, Philadelphia, 1916. Price, $1.75 net.,

BLOOD-PRESSURE: ITS CLINICAL APPLICATIONS. Second edition, revised and enlarged. By GEORGE W. NORRIS, A.B., M.D., assistant professor of Medicine in the University of Pennsylvania; visiting physician to the Pennsylvania Hospital; assistant visiting physician to the University Hospital; Fellow of the College of Physicians of Philadelphia. Octavo, 424 pages, with 102 engravings and 1 coloured plate. Cloth, $3.00 net. Lea & Febiger, publishers, Philadelphia and New York, 1916.

Res Judicatæ

CAN WE KEEP TONSILS AND ADENOIDS FROM BECOMING DISEASED?

AS an explanation as to why such a subject should come before Medical Officers of Health, I beg to submit that at present the mouth and upper respiratory tracts are suspected of being implicated in causing the greater number of diseases we suffer from—ninety per cent. of ear cases, adenitis, rheumatism, endocarditis, tuberculosis, et cetera. If some one will explain how this can be prevented it surely will improve the public health.

I selected one Windsor school of four hundred and sixty-seven pupils between the ages of five and fourteen and analysed the reports made by the school nurse. Only fourteen per cent. were free from diseased teeth and tonsils. Thirty-five per cent. had

Received for publication, June 7th, 1916.
Presented before the Ontario Health Officers Association.

diseased tonsils and adenoids. Sixty-three per cent. had diseased teeth. Fourteen per cent. had diseased tonsils and healthy teeth, three fourths of them over ten years of age. Twenty-one per cent. had diseased tonsils and diseased teeth, half of them over ten years of age. Thirty-seven per cent. had enlarged cervical glands and of these twenty per cent. had normal tonsils and teeth; fifty per cent. had normal tonsils and diseased teeth; ten per cent. had diseased tonsils and normal teeth; twenty per cent. had diseased tonsils and teeth.

If we believe that tissues are present because they are of some use, then we must conclude that some very prevalent mistake in our mode of living favours the occurrence of tonsillitis. Why have so many children diseased tonsils? If we knew what was wrong then we might think of a way to prevent it. This suggests the question of what use are tonsils? Physiologists give us no satisfactory answer. They appear about the fourth month of intrauterine life and atrophy about ten years years of age. They are composed of adenoid and connective tissues and produce lymphocytes. It is believed that their activity ceases about ten years of age and as puberty is reached about this time it has been suggested that there is an internal secretion that has to do with sexual development, but their early removal does not seem to injure development in any way. The faucial tonsils are shut off from the respiratory tract by the posterior pillars so that they are really in the digestive tract and are considered by some as digestive organs, but laboratory experiments do not bear this out for we cannot extract a digestive. That they arrest and destroy bacteria of disease seems certain, but lymphocytes only become phagocytes after the action of the opsonins produced by the eosinophiles, and there is an abundance of lymphocyte-forming tissues elsewhere. At birth the roof of the mouth almost touches the orbit and the development of the bones of the face with their sinuses occurs during the first ten years of life so that it has been suggested that these glands have to do with the catabolism of this process and that is why they atrophy at ten years. Colouring matter injected into the floor of the nose finds its way into the tonsils. In this view the tonsils are simply a part of the lymphatic system, with afferent and efferent vessels draining the nose and sinuses. This is very simple and plausible, but it does not explain why there should be such an aggregation of adenoid tissue in this particular place and it is not in accord with our usual anatomical teaching. Thus we may not be sure of their function, but no doubt they are present for some good purpose, and if we do not know what it is, it is no fault of the tonsils.

Nor are we more certain why they become so often diseased. If they are only lymphatic glands then the infection comes along the afferent vessels from a midus in the area drained by them and they become dangerous, like choked filters. When some tissues are prone to disease it is customary to say that these tissues are vestiges of developmental structures without function in man and disappearing, hence particularly vulnerable. It is true the tonsils are developed from the second visceral arch, but the organs of hearing are developed from the first, and they certainly are not functionless. It is likely the tonsils aid in growth only, and are vulnerable, like the temporary teeth when their work is done.

The commonly accepted view is that infection comes from the mucous surface, the crypts harbour overwhelming numbers of bacteria that produce repeated inflammations with hypertrophy and dangerous nests of the invaders. It has been claimed by a very eminent authority that our overheated dry rooms in winter so irritate the pituitary gland that its influence causes nasal and tonsillar hypertrophies. I do not see why an irritated pituitary should act this way, but I can easily see why the nasal and pharyngeal tissues will be congested in trying to furnish moisture to overheated dry air.

The story of diseased tonsils and adenoids would seem to be this: at birth the infant has tonsils developing rapidly and is exposed to the overheated dry air of the house. Through the pituitary gland or by their efforts to produce humidity the tonsils become hypertrophied while they are already busy eliminating the products of catabolism from the developing sinuses. Now the baby is given a rubber comfort to keep him quiet and this is so filthy that he eats his peck of dirt before he gets a fair start. If there are any kind of diseased germs anywhere about him he surely is likely to absorb them. I have been told that where babies gather together, kind mothers pass the comfort from baby to baby as occasion requires. Nor is the feeding of bacteria the worst thing the comfort does, it arches the roof of the mouth, lessens the capacity of his nares, crumples the cartilaginous septum against the turbinates, obstructing respiration and drainage. Sucking narrows at the same time the soft cartilaginous arches and deforms the teeth. Thumb sucking is the common cause of "buck teeth". Baby gets teeth but unlike his animal friends his teeth become dirty and carious, while infected gums, through the lymphatics or more likely directly through the crypts, assail the tonsils with virulent bacteria. To overcome this the tonsils become congested

and hypertrophied, but continually repeated attacks eventually overcome the valiant lymphocytes and the trenches are entered by the germs which destroy the tissues that support them and make the unhappy tonsil a base for attacks upon the ears, glands, serous surface, and other vital points.

There is no other source of tonsillar infection that can compare with that from the teeth. Yet perhaps at the same time the blocked nose cannot drain properly and germs are absorbed from the nares and sinuses.

Food is so cooked and is of such a nature that chewing is unnecessary, hence the jaws are not sufficiently developed and broadened out. This aids in over arching the palate, and bending the septum as well as in cramping the incoming permanent teeth. Gum chewing, at this period of life, I think is helpful. When five years old he is sent to school, where the air is even hotter and drier than at home, where the teacher's idea of sanitation is to open the window occasionally and the cold draft makes the boy's carious teeth ache. These are pulled out before their time and as a result the permanent teeth come in irregular, overcrowded, and doomed to decay—to infect still further the tonsils even in adolescence. The tonsils and milk teeth live and die together, and when we have solved the cause of carious teeth the problem of tonsil infection will be a small one.

To prevent the disease of tonsils—

1. The air of our homes and schools should be kept at a proper humidity.

2. Every school room should have a hygrometer as well as a thermometer.

3. Baby comforts should be abolished.

4. Proper food properly chewed would perhaps avoid caries of the teeth, but in the meantime;

5. Healthy milk teeth should be kept healthy by cleanliness, and decayed milk teeth should be cared for at once by a dentist.

6. During the milk teeth period the chewing of a hard gum fifteen minutes after meals would be helpful.

7. If nasal obstruction has occurred or any of the tonsillar tissues have become infected they should be attended to at once by a competent surgeon.

8. Any tonsil that is not atrophied at ten years of age is abnormal and should get proper treatment at once.

Windsor, Ontario. G. R. CRUICKSHANK.

Obituary

A NOTICE of the death of the late Lieutenant-Colonel A. W. Tanner, C.A.M.C., of Moosomin, Saskatchewan, appeared in the last issue of this JOURNAL. The *British Medical Journal* writes: "Lieutenant-Colonel A. W. Tanner, commanding the 10th Canadian Field Ambulance, died from wounds received on June 3rd. He was born at Watford, Ontario, in December, 1875, graduated at Toronto University in 1899, and settled in practice in Moosomin, Saskatchewan. There he rapidly made his mark as a general practitioner and most capable surgeon. In 1910 he joined the 16th Canadian Light Horse, allied with the 16th (the Queen's) Lancers, and within a month of the beginning of the war was given his lieutenancy in this brigade. From being a combatant officer he transferred to the C.A.M.C. and last year was appointed A.D.M.S. of the 10th Canadian Military District, which included the provinces of Manitoba and Saskatchewan. As such he was in medical charge of the Sewell camp in Manitoba, and later was largely instrumental in bringing together and establishing the 10th Field Ambulance. This unit arrived in England on March 13th, 1916, and within a month was at work at the front. Here Colonel Tanner immediately impressed all with whom he came into contact as a most capable officer with administrative abilities of the first order. His death is a very distinct loss to the Canadian Army Medical Service."

Surgeon-General Carleton Jones, D.M.S., Canadian Expeditionary Force, writes: "Lieutenant-Colonel Tanner I have only known a short time, since he joined the Expeditionary Force in England, but from what I saw of his work in England and in France, I was particularly struck with his natural ability for military medical work. I feel his loss very much, as it means that the service is deprived of a most capable and useful officer."

DR. T. W. VARDON, of Galt, Ontario, died of heart failure on June 30th, being taken ill suddenly while playing a round of golf. Although in the seventy-fifth year of his age, Dr. Vardon continued his professional duties to the day of his death. He had practised in Galt for thirty years, and had earned the respect and

affection of all classes of the community. Thomas Wyre Vardon was born in Pickering Township, a few miles east of Toronto. He graduated at Victoria College, Toronto, in 1866, and went into practice at Cornibus, now Markdale, for two years. From there he went to Hawkesville, North Waterloo, where he practised for eighteen years, and in February, 1886, removed to Galt. He was medical officer of health at Galt for sixteen years, and for eight years was a member of the Ontario Medical Council. At the time of his death he was a member of the Executive of the Provincial Board of Health. Besides being a trusted and popular physician he was an eloquent speaker and a keen sportsman.

Dr. Thomas Henderson, of Detroit, Michigan, died July 4th. Dr. Henderson was born in Exeter, Ontario, in 1855.

Dr. J. F. Mather, who practised for a number of years in Belleville, Ontario, died at Long Beach, California, on June 30th.

Dr. Elizabeth C. Secord, of Farmeston, New Brunswick, died July 4th, in the seventy-third year of her age. Dr. Secord was the daughter of the late Daniel Smith, of Blissville, New Brunswick, and became the wife of the late John Secord, of Norton, in the same province. Left a widow, she entered upon the study of medicine at Keeokuk, Michigan; after graduation she spent some time in the London hospitals and did some post-graduate work at the University of Dublin, and in 1883 obtained a licence to practise in the province of New Brunswick. She was the first woman to practise in the province and settled at Fredericton Junction, then went to Norton, and finally to Farmeston where she continued to practise until a few months before her death.

Dr. Stuart Aird Ross died at Vancouver on July 9th. He was the son of the late Dr. W. D. Ross and graduated from McGill University in 1900. He was forty years of age and was in practice at Lytton, British Columbia.

News

MARITIME PROVINCES

SEVEN hundred and ninety-nine patients were admitted to the Moncton General Hospital during the year ending May 31st, 1916—559 private patients and 240 public patients. The number of patients discharged cured was 629, those improved 47, not improved 19, incurable 10. Seventeen patients were not treated and 45 died.

THE annual meeting of the Board of Management of the Hazelwood Sanitarium, Halifax, was held on June 13th. During the year 43 patients were admitted, 18 were discharged, 15 showed improvement, and 9 were working. The treasurer's report showed a balance of $342.40 in favour of the sanitarium.

ONTARIO

THE following cases of communicable disease were reported in the province during the month of June: smallpox, 44 cases; scarlet fever, 121 cases, 2 deaths; diphtheria, 165 cases, 17 deaths; measles, 2,039 cases, 14 deaths; whooping cough, 135 cases, 7 deaths; typhoid fever, 35 cases, 7 deaths; tuberculosis, 153 cases, 86 deaths; infantile paralysis, 2 cases, 1 death; cerebro-spinal meningitis, 11 cases, 9 deaths.

DR. J. H. RADFORD has been appointed medical officer of health at Galt in succession to the late Dr. T. W. Vardon.

IT has been decided not to enlarge the Orillia General Hospital at present, as the cost of the proposed alterations would be too great.

SEVERAL cases of a mild form of smallpox have been reported in the neighbourhood of Zion and Mull in Harwich Township.

THE formal opening of the Port Hope Hospital took place on June 29th.

THE by-law to grant the sum of $58,000 to the Brantford General Hospital has been passed, the votes being 469 for and 295 against it.

DR. GEORGE C. KIDD, medical superintendent of the Cobourg Hospital for the Insane, has been appointed assistant medical superintendent of the Brockville Hospital for the Insane.

QUEBEC

AN assistant physician is urgently required at the Mount Sinai Sanatorium for Incipient Tuberculosis, at Ste. Agathe des Monts. The position offers exceptional advantages for clinical work and scientific investigation and the remuneration offered for the first year is five hundred dollars. There are opportunities for advancement with a possibility of succeeding to the superintendency within a year. A licensed graduate of the Jewish faith would be preferred, especially one who has had some experience in the handling of tuberculous patients; a provincial licence is not absolutely essential. Applications should be addressed to Mount Sinai Sanatorium, Room 209, 591 St. Catherine Street West, Montreal.

THE next meeting of the Association for the Prevention of Tuberculosis will be held at Quebec on the 11th and 12th of September.

THE annual convention of the Canadian Public Health Association will take place at Quebec on the 12th, 13th, and 14th of September next.

BRITISH COLUMBIA

THE new Kootenay Lake General Hospital, Nelson, is to be commenced at once.

THE twenty-sixth annual meeting of the directors of the Provincial Royal Jubilee Hospital took place at Victoria on June 27th. The reports presented showed increased activity in every branch of the hospital work during the year in spite of the war and financial depression. The receipts for the year ending May 31st, 1916, amounted to $79,620.52 and the financial statement closed with a cash balance of $312.82. The admissions during the year

numbered 1,812, an increase of 254 over the previous year. The average cost of maintenance for each patient amounted to $1.86 a day; this is one cent a day less than last year and is the more noteworthy in view of the increased cost of living. A reduction of $2.50 a week has been made in the charges to private patients during the war. A maternity ward has been opened on the ground floor of the children's ward, as the funds raised by the Women's Auxiliary—$3,203.70, with the contribution of $380.97 from the Bachelor's Fund, were insufficient to build a new ward, and the hospital is now able to give student nurses instruction in maternity work. This naturally has increased the number of nurses and an addition to the Nurses' Home to accommodate thirty-five more nurses is urgently needed. The wards have been much overcrowded during the year and at times it was necessary to turn some of the private rooms into wards for public patients. In the earlier part of the year, great difficulty was experienced in securing assistance and for several periods Dr. Edward Hasell, the medical superintendent, was single handed. In November, Dr. E. C. McFarlane, of London, Ontario, accepted the position of house surgeon. It has been difficult also to retain the services of male nurses and orderlies, who have enlisted one after the other. In the report of the directors of the hospital, satisfaction was expressed concerning the recent comment of the grand jury on the crowded condition of the tubercular ward, as no public help has ever been received by the hospital towards the erection of new buildings. The plans have been prepared for the new ward, which will cost about $5,000 and the Victoria City Council has now made a grant of $2,500 towards this amount. The municipalities of South Saanich, Esquimalt, and Oak Bay have each promised $250, but no reply has been received as yet from the Provincial Government.

Dr. Morley, of Vancouver, has been appointed medical officer of health at Gloverdale in succession to Dr. Sinclair, who has left for overseas service.

MEDICAL COLLEGES

McGill University

A special convocation was held at McGill University on July 10th, when the degree of M.D., C.M. was conferred upon the following candidates, fourteen in number. These men accom-

panied the McGill Military Hospital to France and after eight months of service returned to Montreal. They were given a special course in order that they might complete their studies and return to the front. M. C. Abell, of Aylmer West, Ontario; C. K. Church, B.A., of Aylmer, Quebec; G. Lockhart Gall, B.A., of Lachute, Quebec; N. M. Guiou, of Ottawa; C. J. Kendall, of Ottawa; W. C. Lowry, B.A., of Lennoxville, Quebec; G. A. Lyons, of Moncton, New Brunswick; E. A. McCusker, of Regina, Saskatchewan; H. J. Mack, of Cornwall, Ontario; W. E. Ord, of Weston, Ontario; H. G. C. Paine, of St. Johns, Newfoundland; F. G. Pedley, B.A., of Montreal; R. F. Price, of Albert Bay, British Columbia; and L. C. Reid, of North Bay, Ontario.

The honour list follows: Honours in aggregate of all subjects of the year, N. M. Guiou, Ottawa. Honours in medicine and clinical medicine, N. M. Guiou, Ottawa. Honours in surgery and clinical surgery, N. M. Guiou, Ottawa. Honours in gynæcology, 1, N. M. Guiou; 2, E. A. McCusker and F. G. Pedley, B.A. Honours in ophthalmology, 1, F. G. Pedley, B.A.; 2, R. F. Price. Honours in oto-laryngology, 1, N. M. Guiou and R. F. Price; 2, M. C. Abell and F. G. Pedley, B.A.; 3, H. J. Mack. Honours in pathology, 1, N. M. Guiou, 2, F. G. Pedley, B.A.

Dalhousie University

Captain Frank Woodbury has recovered from his recent illness and is on duty again with the Dalhousie Military Hospital. While at Shorncliffe, the unit had charge of the administration of the Helena Hospital which was taken over by the Canadian Army Medical Corps as a hospital for Canadian officers. The work in connexion with this hospital was in charge of Major L. M. Murray, who was also supervisor of the medical division of the Shorncliffe Military Hospital.

Laval University

The following candidates have successfully passed the examinations and received their medical degree from Laval University, Montreal: Stanislas Choquette, Joseph Coallier, Ernest Gariepy, Desire Helie, Elphage Jacques, Leopold Lamoureux, Lionel Lamy, Albert La Roche, Armand Larose, Leo. Lavigne, Oscar Le Riche, Albert Levesque, Henri Mailloux, Rodolphe Michaud, Albert Poisson, Leonide Viens, Lucien Mackay.

ARMY MEDICAL SERVICES

A "CASUALTY COMMAND" has been established by Order in Council as a regular branch of the Canadian Expeditionary Force. The command will be under the direction of the Military Hospitals Commission, and will have charge of all matters relating to returned convalescent soldiers. Units will be established in each military district in the Dominion, where all questions of pay, discipline, and medical attention will be administered so far as disabled soldiers who have returned from the front are concerned. The new command, it is understood, will be under the direction of Lieutenant-Colonel Sharples, of Quebec, who has been in charge of the depot for returned soldiers there. Up to the present, this work has been in charge partly of the Military Hospitals Commission and partly of the Militia Department; the new arrangement places the whole work under one authority. Mr. Scrammell, secretary of the Commission, recently stated that seven hundred returned soldiers had already been placed in convalescent hospitals and homes in addition to about one thousand out-patients, and that two hundred and fifty had been placed in sanitariums. A hospital for mental disorders and cases of shock among returned members of the Expeditionary Force has been established at Cobourg, Ontario, and has accommodation for about three hundred patients. Dr. Vrooman, assistant superintendnent of the Brockville Hospital for the Insane, has been appointed superintendent.

THE following promotions are announced in the C.A.M.C. To be Colonel: Lieutenant-Colonel A. Migneault, of Montreal, commanding officer of the Canadian Hospitals at St. Cloud, Paris. To be temporary Colonel: Major F. McKelvey Bell, of Ottawa, acting deputy director of medical service. To be temporary Captain: Dr. J. H. Slater. To be temporary Lieutenant: Sergeant-Major McTaggart. To be Nursing Sisters: Misses M. Condon, G. L. Edgecombe, A. P. Gamblin, M. E. Lewin, F. M. Hocken, A. C. Craig, and C. Brunelle.

THE Military Cross has been awarded to Lieutenant Peter McGibbon, C.A.M.C., of Bracebridge, Alberta.

IT is announced by private advice that Private Manhire, of the Ninth Field Ambulance, has been awarded the D.C.M. for distinguished conduct in the field.

THE following Lieutenants in the C.A.M.C. have been appointed temporary Lieutenants in the R.A.M.C.: H. S. McSorely, M.D.; G. H. Clement, M.B.; G. B. Archer, M.B.; B. W. Mosher, M.D.; P. Nase, M.D.; G. O Hutchinson, M.D.; E. E. Bryans, M.D.; T. J. Waddell, M.D., J. N. Lyons, M.D.; S. Rodin, M.D.; G. B. Ferguson, M.D.; W. A. Murray, M.D.; E. Fidlar, M.B.; E. L. Steele, M.D.; C. S. Tennant, M.B.; I. Vandandaigue, M.D.; J. W. Evans, M.D.; A. Mackinnon, M.B., and R. Stipe, M.B.

LIEUTENANT G. W. Whitman, of Stellarton, Nova Scotia, has been gazetted Captain in the R.A.M.C.

THE safe arrival in England of No. 12 Field Ambulance (Winnipeg) and No. 13 Field Ambulance (Victoria) was announced on July 7th.

DR. ERIC K. CLARKE and Dr. F. F. Tisdale, of the Toronto General Hospital, have joined the staff of a military hospital at Shorncliffe.

THE following have been appointed medical officers of overseas battalions: Captain W. J. Goulds, of Brantford, Ontario, of the 111th Battalion; Captain H. K. Manning, of Toronto, of the 198th Battalion; Captain O. J. S. Little, of Seaforth, Ontario, of the 220th York Rangers; Captain Manchester, of the Royal Columbian Hospital, New Westminster, of the 131st Battalion.

THE following doctors have joined the Royal Army Medical Corps: Dr. C. C. Fisette, of Brantford, Ontario; Dr. R. D. Ferguson, of Winnipeg.

DR. A. C. DELACROIX, assistant resident physician of the Willard Parker Hospital, New York, has joined the staff of the 237th American Legion Battalion at Halifax.

CAPTAIN L. D. COLLIN, of Winnipeg, has been promoted to the head of the surgical department of the Laval University Hospital with the rank of major. The hospital is now stationed at St. Cloud, near Paris.

LIEUTENANT-COLONEL CARTER, C.A.M.C., has been appointed medical officer at Niagara Camp. Captain Proctor, of Kingston, has been appointed medical officer at the Minnewaska Sanitarium.

DR. THOMAS E. STATON, formerly consulting physician at Guy's Hospital, London, has enlisted as a private in the Canadian Army Medical Corps. His eldest son was recently killed in action and his three other sons are serving with the colours.

CAPTAIN H. A. HESSIAN, C.A.M.C., of Vancouver, has left for service in Flanders. Dr. G. S. Gordon, of Vancouver, has also left for service overseas.

CAPTAIN VICTOR MCWILLIAMS, of Toronto, who has returned after a year's service with the R.A.M.C., has joined the C.A.M.C. and is now on the staff of the Training Depot at Camp Borden.

THE following doctors have joined the C.A.M.C. for service overseas: Dr. J. F. Murphy, of Chicago; Dr. E. L. Madison, of Eau Clair, Wisconsin; Dr. Joseph E. Johnson, of Memphis, Tennessee; Dr. F. E. Fraser, of Jacksonville, Florida;

CAPTAIN CONRAD G. GEGGIE, C.A.M.C., of Quebec, has been appointed medical officer of the New Brunswick Highland Battalion which is being recruited under Lieutenant-Colonel Percy A Guthrie. Captain Geggie, who is to be promoted to Major, went to the front with the First Canadian Division as an officer in the First Field Ambulance Corps and served with that unit at the battles of Neuve Chappelle and Ypres. After the battle of Ypres, Captain Geggie was transferred to the 10th Battalion then under the command of Colonel Guthrie, and took part in the battles of Festubert, Givenchy, Cuinchy and Messines. He was wounded and invalided to Canada, leaving England on the *Hesperian*. When the vessel was torpedoed, Captain Geggie carried Lieutenant-Colonel Guthrie, who was unable to walk up on deck and procured a life belt for him, and afterwards assisted in the rescue of a number of women and children, himself being one of the last to leave the ship. He is a graduate of Laval University.

MAJOR W. H. IRVINE, of Fredericton, New Brunswick, has joined the Field Ambulance Corps now in process of organization at St. John.

Captain Edwin Douglas, of Halifax, who left as regimental medical officer of the 40th Battalion, has been transferred to the staff of the Dalhousie Military Hospital which is now in France.

Captain J. F. James, of London, Ontario, has resigned his position as medical officer of the 149th Battalion.

The following is the nominal roll of officers of the West Cliff Canadian Eye and Ear Hospital at Folkestone, Kent:

Lieutenant-Colonel J. D. Courtenay, officer commanding; Lieutenant-Colonel S. H. McKee, C.M.G., second in command; Major A. B. Osborne, eye clinic; Majors W. J. Brown and H. W. DuHamel, ear and throat clinic; Captain P. G. Bell, registrar and adjutant; Captain H. D. Courtenay, medical officer; Captain J. P. Harrison, eye clinic; Captains S. J. McLennan and C. W. Waldron, ear, nose, and throat clinic; Hon. Lieutenant A. F. Marshall, quartermaster. Supernumerary: Captain J. W. Bell, Canadian Army Dental Corps, attached for duty. Our attention has been drawn to an error which appeared in the May number of the Journal, when it was stated that Lieutenant-Colonel Hanford McKee was the commandant of this hospital and that Lieutenant-Colonel P. Goldsmith was second in command. Lieutenant-Colonel Goldsmith is not attached to the West Cliff Hospital but is on the staff of the Duchess of Connaught Canadian Red Cross Hospital, Taplow.

No. 4 Canadian Stationary Hospital has been converted into a general hospital and is under the command of Lieutenant-Colonel Lebel. Colonel Mignault has been promoted to be senior officer commanding this unit and the Laval Military Hospital, both of which are now stationed at St. Cloud, near Paris.

CASUALTIES

Died of Wounds

Captain Blaine Haversom, R.A.M.C., of Carman, Manitoba. Captain Haversom was the son of Mr. John Haversom, a prominent lawyer of Carman, and was in the twenty-seventh year of his age. He was a graduate of Manitoba Medical College, and for a time was house surgeon in the Winnipeg General Hospital His death occurred on June 25th.

Prisoner of war

CAPTAIN W. R. W. HAIGHT, C.A.M.C., of Toronto. The gallant stand made by Captain Haight is described in a letter written by a Canadian officer who took part in the Hooge battle: "Captain Haight, who was medical officer to the —— Battalion, was dressing wounded soldiers in the dressing station when the Huns swept up to the station, entered and bayonetted the sergeant and the men who were assisting him. Infuriated, Captain Haight grabbed his Colt revolver, backed up into a corner and accounted for several Huns before his revolver was empty. Then he fell, pierced by the bayonets of the cowardly assassins." It was feared at first that Captain Haight had been killed. Official reports, however, state that he has been taken prisoner.

Wounded

CAPTAIN N. MACLEOD, C.A.M.C.
LIEUTENANT ERNEST NIVIN, R.A.M.C.

Seriously ill

NURSING SISTER GERTRUDE MULDREW, of St. Thomas, Ontario.
NURSING SISTER ALBERTA B. ARMSTRONG, of Trenton, Ontario.

A REPORT was recently published by the Canadian Army Dental Corps for the period from July 15th, 1915, to March 31st, 1916. During this time, 201,610 dental operations were performed, including 66,079 extractions, 86,887 fillings, 15,304 treatments, 10,898 dentures, 10,710 prophylaxis treatments, 11,732 devitalizations.

Canadian Literature

Original Contributions

The Canadian Journal of Medicine and Surgery, July, 1916:

The Ontario Medical Association: President's Address	H. B. Anderson.
Motion study in surgery	F. B. Gilbreth.

The Canadian Practitioner and Review, July, 1916:

The treatment of the blind after the war	B. C. Bell.
The lost art in obstetrics	J. Hunter.
Cerebro-spinal meningitis in Ontario	J. G. Fitzgerald.

The Public Health Journal, June, 1916:

Sewage disposal by the activated sludge process	T. Chalkley Hatton.
Presidential address, Ontario Medical Association	H. B. Anderson.
The married women in industry	J. Martin.
The periodic medical examination	G. Elliot.
Antityphoid inoculation in soldiers	G. B. Porter.
The construction of a sanitary dwelling	W. A. Thornley.

The Western Medical News, June, 1916:

Pituitrin in labour	J. A. Valens.
Report of a case of spina bifida, operated on the fourth day after birth	J. W. Turnbull.

L'Union Médicale du Canada, June, 1916:

Le foie, glande à sécretion interne	E. P. Benoit.
Conception moderne de l'enseignement théorique de la pathologie interne	A. Lesage.

Medical Societies

THE MEDICAL COUNCIL OF CANADA

THE fourth annual meeting of the Medical Council of Canada took place at Ottawa on June 6th and 7th, the president, Dr. R. J. Gibson, in the chair and the registrar, Dr. R. W. Powell, acting as secretary. The following members were present: Sir Thomas Roddick, Hon. Dr. Thornton, Hon. Dr. Brett, Drs. Connell, Dagneau, Harris, Popham, Braithwaite, Lachapelle, MacCallum, McKechnie, McCallum, MacNeill, Morgan, Normand, Park, Shepherd, Simard, Spankie, Sugden, Thomson, Walker, White, and Young.

In presenting his report, the registrar expressed his satisfaction that throughout the past twelve months the administration of the affairs of the Council had gone steadily forward without friction of any kind, and reported that during that period twenty men had been enrolled under the ten year clause, and that a number of certificate forms were still outstanding. He was of opinion, however, that the absence of reciprocal arrangements between the Council and Great Britain had been one of the deterrant factors against the full success of the Council, both as to registration under the ten year clause and candidates for examination for the degree of L.M.C.C., and that the attitude adopted by the province of British Columbia in demanding examination in the final branches from those seeking their registration under the ten year clause had also operated to some extent against registration. During the year 1915, examinations were held at Winnipeg in June and at Montreal in October. Forty candidates presented themselves at the June examination and of these twenty-one passed successfully, twelve were rejected, and seven were referred. In October the candidates numbered forty-eight, of whom twenty-eight passed, eleven were rejected, and nine were referred in one or two subjects. It was the intention to hold the autumn examinations concurrently at Montreal and Halifax, but as the number of applicants for Halifax was small, it was decided to bring the Halifax candidates to Montreal and to pay their expenses rather than incur the expense of an examination at Halifax. This year the intention was to hold examinations at Winnipeg and Toronto, but less than ten candidates

registered for Winnipeg and it was decided to pay their expenses to and from Toronto and hold the examinations at Toronto only. The date of the spring examinations has been found to conflict with graduation in some of the universities and it is hoped that these examinations in future will be held at a date on which newly graduated men may be able to take them. Up to the present this has been impossible, or has been rendered possible only by the faculties of the universities holding examinations for graduation earlier than the scheduled dates.

The following is the list of candidates who were successful in passing the examinations of the Council held in Toronto last June: J. E. Affleck, of Glasgow Station, Ontario; C. M. Anderson, of Ottawa; S. G. Baldwin, of Vancouver; W. S. Downham, of London, Ontario; J. W. Fraser, of Whitby, Ontario; R. G. Ferguson, of Winnipeg; G. Hooper, of Ottawa; D. M. Livingstone, of Collingwood, Ontario; W. T. Kennedy, of Agincourt, Ontario; J. J. Knoll, of Daysland, Alberta; A. Y. McNair, of Vancouver; H. M. Macdonald, of Kingston; and W. Morris, of Winnipeg.

In the presidential address, Dr. Gibson said that three members of the Council were on active service, namely the vice-president Dr. Stewart, Dr. Kendall, and Dr. Bapty. He made fitting reference to the late Dr. Lindsay, of Halifax, and Dr. Jones, of Winnipeg, who have both died since the last session of the Council, and congratulated the Hon. Dr. Brett upon his appointment as Lieutenant-Governor of the province of Alberta. Reviewing the work of the Council he said that the number of men registering under the ten year clause had been less than had been expected but had improved during the last year and no doubt would continue to increase. The number of candidates coming up for examination had declined but this was probably due to the war. The province of Saskatchewan now accepted only the certificate of the Medical Board of Canada and he hoped other provincial boards would avail themselves of the examinations of the Dominion Medical Council.

The question of reciprocity between the Medical Council of Canada and the British Medical Council was brought up by Professor A. B. MacCallum, of the University of Toronto. Dr. Thornton referred to the communication upon this subject received from the Registrar of the British Medical Council which was submitted to the Council last year and which stated that such reciprocity was impossible unless reciprocal relations were first entered into by each of the provinces of the Dominion. Dr. Thornton

stated that with the exception of Alberta reciprocity was now in force between Great Britain and all the provinces of Canada.

A letter from the honourable Mr. Justice Hodgins was submitted to Council and the president and registrar were appointed to represent the Council before the Medical Commission.

A communication from Dr. McKechnie was read by the registrar, submitting an extract from a letter from one of the doctors with No. 5 Canadian Base Hospital, now at Salonica, referring to the importance of impressing upon the Canadian authorities the necessity of giving every man who enlists in the Canadian Army Medical Corps the privilege of terminating his engagement at the end of one year's service. The matter was brought to the attention of the Minister of Militia by the Executive Committee, who were referred to General Fiset and later to Colonel Potter, director general of medical services. The Committee were informed that if individual application were made members of the Canadian Army Medical Corps would be allowed to return to Canada after one year of active service.

A resolution was passed approving of the appointment of graduates of recognized American colleges of medicine to medical commissions in the American Legion or other units on the same footing as Canadian graduates. This matter was also brought to the attention of the Minister of Militia by the Executive Committee, who were informed that equal facilities would be granted by the Department of Militia to United States graduates for service with the American Legion or similar units, providing such graduates were fully qualified and of good standing.

An interim report of the Committee on Standards of Education and Examination was presented and the Committee was instructed to complete and print it as soon as possible. The report of the Executive Committee was read by the registrar and was adopted.

Dr. J. C. Connell, of Queen's University, Kingston, gave notice that he would introduce the following motion at the next meeting of Council, which will take place in Ottawa on June 12th, 1917:

> "Whereas it is desirable that this Council shall apply its resources towards the elevation of the standards of medical education in Canada.
>
> "Resolved that a scholarship be established to be awarded to the candidate making the highest total of marks in each of the examinations held by the Council the amount of the scholarship to be sufficient to permit the holder to spend at least a year in professional studies abroad, the direction of these studies to be under a committee of the Council."

Dr. R. E. Walker also gave notice that he would introduce the following resolution:

> "That the Medical Council of Canada appoint a Special Committee whose duty it shall be to inspect personally, and report upon the various medical schools and universities of Canada actively engaged in the teaching of medicine."

The Council will hold examinations at Montreal and Halifax coincidently on the second Tuesday in October, 1916, and at Toronto and Winnipeg on the third Tuesday in June, 1917. The officers for the year 1916-17 are: president, Dr. W. W. White, of St. John, New Brunswick; vice-president, Dr. E. P. Lachapelle, of Montreal; registrar, Dr. R. W. Powell, of Ottawa.

THE MEDICAL SOCIETY OF THE C.A.M.C., SHORNCLIFFE

THE third meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held at Moore Barracks Officers' Mess, Memorial Hall, Sandgate, at 8 p.m., February 7th, 1916. Colonel G. S. Rennie, president, in the chair.

The minutes of the previous meeting were read and approved. Captain H. K. Bates, of the Military Hospital, Shorncliffe, was elected secretary to succeed Captain Mann.

Mr. Wilson gave a demonstration of the lungmotor said to be an i nprovement of the pulmotor and used for similar purposes.

Six clinical cases were shown:

1. A case of abdominal tumour, Major R. Bowie, Moore Barracks Hospital.

2. Two cases of paralysis of the hand; one caused by a cerebral lesion, and one by polio myelitis, Captain J. C. Wickham, Moore Barracks Hospital.

3. A case of foreign body in the brain, Captain R. W. Kennedy, Moore Barracks Hospital; *x*-ray photo shown by Captain W. H. Eagar, radiologist, Military Hospital, Shorncliffe.

4. Two cases of soldiers' irritable heart, Captain R. W. Kennedy, Moore Barracks Hospital.

A paper entitled "An analysis of one hundred and thirteen cases of trench nephritis" was read by Major A. Mackenzie, Moore Barracks Hospital.

The meeting was then adjourned.

The fourth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held at West Cliff Eye and Ear Hospital, February 28th, 1916, at 8 p.m. Colonel G. S. Rennie, president, in the chair.

The minutes were read and approved.

Twenty-one clinical cases were exhibited. Left optic neuritis, luetic, following full course antisyphilitic treatment.

Two cases persistent sinus following mastoid operation, carious bone removed.

One case traumatic enucleation of eye caused by bomb explosion. Wound around mastoid caused facial paralysis.

One case habit spasm due to shell fire.

One case acute mastoiditis, radical operation.

Two cases of trachoma.

Two cases of iritis.

One case angular conjunctivitis, Morax bacillus shown.

One case gunshot wound (bullet) left eye.

One case concussion right eye-ball causing vitreous hæmorrhage from choroid. This is a common type of case in this war. The injury was a bullet wound of slight severity at external border of right eye. The injury caused immediate blindness.

One case choroiditis and retinitis, luetic, following full course of treatment.

One case injury to eye necessitating enucleation.

One case explosive injury to left eye. A motor mechanic in soldering a copper tube into a motor cycle unknowingly used a piece of a detonator which exploded.

A case of mucocele of eye. Drainage through antrum.

One case shell wound left antrum of Highmore. Persistent sinus. Drainage into nose and mouth.

One case infection of antrum caused by shell wound.

One case infection of antrum caused by bullet wound.

A case of nasal obstruction caused by adhesions between septum and turbinate, both sides, following submucous resection; inferior turbinate removed, adhesions separated, result good.

A case of fracture of mandible, special splint. Captain C. Waldron.

3. Address on "The purpose of the hospital," Lieutenant-Colonel Courtenay, O.C.

4. Notes on "Special work in Stationary Hospital at front," Lieutenant-Colonel S. H. McKee.

5. Paper on "Special work in the field ambulance at the front," Captain P. Bell.

The fifth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, March 13th, 1916, at Moore Barrack Officers' Mess, Chichester Memorial Hall, Sandgate, Lieutenant-Colonel Wallace A. Scott, vice-president, in the chair.

The minutes were read and approved. There being no further business the programme of the evening was proceeded with.

1. A case of paraplegia

A case of unilateral tremor, Captain R. W. Wilson, Moore Barracks Hospital.

2. A case of somatic tic, Captain R. W. Kenny, Moore Barracks Hospital.

3. Two cases of psoriasis;

Two cases of eczema, Captain H. R. Mustard, Moore Barracks Hospital.

4. A case of musculo spinal paralysis, Major E. Hogan, Shorncliffe Military Hospital.

5. Pathological specimens, Captain G. Wallace, Moore Barracks Hospital.

Horseshoe kidney;
Double hydronephrosis;
Acute endocarditis.

6. An interesting paper entitled "Fallacies in the localization of foreign bodies by the *x*-ray" was read by Captain W. H. Eagar, radiologist, Moore Barracks and Shorncliffe Military Hospitals.

The sixth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, March 27th, 1916, at Moore Barracks Officers' Mess, Sandage, Lieutenant-Colonel Scott, vice-president, in the chair.

The minutes of the previous meeting were read and approved. Captain R. W. Kenny, Moore Barracks Hospital, and Lieutenant-Colonel S. Hanford McKee, West Cliff Eye and Ear Hospital, were elected members of the programme committee.

The following clinical cases were shown:

1. A case of locomotor ataxia, Captain R. W. Wilson, Moore Barracks Hospital.

2. A case of cerebro-spinal syphilis, Major A. McKenzie, Moore Barracks Hospital.

3. A case for diagnosis, Captain G. L. Kennedy, Moore Barracks Hospital.

4. Four skin cases:
   (a) seborrhœic eczema.
   (b) squamous syphilide.
   (c) acute eczema.
   (d) Hanot's purpura, Captain H. B. Mustard, Moore Barracks Hospital.

5. A case of tumour of the neck, Captain H. C. Hall, Moore Barracks Hospital.

6. A case of extra genital chancre;

A case of ulcerative stomatitis, Captain A. W. Bagnall, Shorncliffe Military Hospital.

A specimen of lung tissue from a case of acute miliary tuberculosis was shown by Captain G. Wallace, Moore Barracks Hospital, the interest in the specimen being in the fact that though the lung tissue showed numerous advanced lesions, the sputum had been repeatedly negative.

A paper entitled "Notes from the board room" was read by Captain Charles Hunter, Standing Medical Board.

The meeting was then adjourned.

The seventh meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, April 10th, 1916, at Moore Barracks Officers' Mess, Sandgate, Lieutenant-Colonel W. Scott, vice-president, in the chair.

The minutes were read and approved. There being no further business, the programme of the evening was proceeded with.

The following clinical cases were shown:

1. A case of ankylosis of the inferior maxilla, Captain G. L. Kennedy, Moore Barracks Hospital.

2. A case of traumatic facial paralysis, Captain H. C. Hall, Moore Barracks Hospital.

3. A case of submaxillary adenitis, Captain G. L. Kennedy, Moore Barracks Hospital.

4. Two cases of phthisis associated with trauma, Captains Kenny and Pratten.

5. A case of exophthalmic goitre.

A case of disordered action of the heart. Major A. MacKenzie, Moore Barracks Hospital.

6. A case of functional neurosis, Captain R. W. Wilson, Moore Barracks Hospital.

The programme being completed, the meeting was adjourned.

The eighth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, April 24th, 1916, at Granville Canadian Special Hospital, Ramsgate, on the invitation of Lieutenant-Colonel Watt, commanding officer. Ninety members and guests were present. Seventy members left Shorncliffe in ambulances, and arrived at Ramsgate at one p.m., where luncheon was provided by the medical staff at Chatham House, Ramsgate Hospital annexe.

After luncheon the members were shown round the hospital workshops and gymnasium. In these shops all splints and other appliances for treating orthopædic cases are made, also all motor repairs for hospital ambulances are done in a special department.

The medical meeting was called at 2.45 p.m., Lieutenant-Colonel Scott, vice-president, occupied the chair.

The following programme was presented by members of the Granville Hospital Staff.

1. Paper entitled "Psychogenetic condition," Major C. Russel.
2. Paper entitled "Posture as an aid to treatment," Major S. A. Smith, D.S.O.
3. Presentation of cases:
   (a) A case of "Pyloric ulcer," Captain A. S. McLeod.
   (b) A case of "Atrophy of the shoulder muscles," Captain Collins.
   (c) A case of "Sacrolization of the fifth lumbar vertebra," Captain D. A. Clark.
   (d) A case of "Bilharzia hæmatobia" with demonstration of the ova, Captain A. R. Robertson.
4. Exhibition of radiographs, Captain McMehan, radiographer.

The programme having been completed the members adjourned to the Officers' Mess where tea was served, after which an inspection of the main hospital took place. This hospital is very well equipped and the members of the staff were very obliging in showing all the apparatus in each department.

The inspection of the hospital concluded the meeting and the members returned to Shorncliffe, arriving about 6.30 p.m.

The ninth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, May 8th, at Moore Barracks Officers' Mess, Memorial Hall, Sandgate, at 8 p.m., Colonel G. S. Rennie, president, in the chair.

The minutes were read and approved. There being no further business the programme was proceeded with.

1. Paper on Syphilis with demonstration of drawings and microscopical demonstration of "Leucocytozoon syphilidis," J. E. R. McDonach, F.R.C.S., surgeon to out-patients, London Lock Hospital.

2. A report of some cases of syphilis of the eye following treatment by salvarsan, Captain H. D. Courtenay, Westcliff Eye and Ear Hospital.

3. Exhibition of clinical cases:

(a) An exhibition of five cases of primary and five cases of secondary syphilis. Captain A. W. Bagnall, Shorncliffe Military Hospital.

(b) A case of general paresis, Captain Mustard, Moore Barracks Hospital.

(c) A case of general paresis, Captain A. W. Bagnall, Shorncliffe Military Hospital.

4. Demonstration of Spirochæta pallida from a primary sore, Captain H. K. Bates, Shorncliffe Military Hospital.

The programme having been completed the meeting was adjourned.

COLLEGE OF PHYSICIANS AND SURGEONS OF ONTARIO

THE annual meeting of the Council of the College of Physicians and Surgeons of Ontario opened on Tuesday, June 27th. The new members taking their seats were Dr. F. R. Eccles, of London, and Dr. J. C. Connell, of Kingston.

The officers elected for the Council year 1916-1917 were:

President, Dr. Edmund E. King, Toronto; vice-president, Dr. W. E. Crain, Crysler, Ontario; registrar-treasurer, Dr. H. Wilberforce Aikins, Toronto; solicitor, H. S. Osler, K.C., Toronto; auditor, James F. Lawson, Toronto; stenographer, George Angus, Toronto; prosecutor, John Fyfe, Toronto.

The report of the Board of Examiners showed that, in the spring examinations of 1916, there were in all one hundred and twenty-nine candidates, of whom eighty-eight passed, and forty-one failed.

Dr. W. Spankie, of Wolfe Island, and Dr. H. S. Griffin, of Hamilton, were appointed, as representatives of the College, for the coming four years, on the Medical Council of Canada.

Appeals, emanating from twenty-four candidates, who had failed at the recent examinations, were considered. Of these two only were entertained.

The question of the proper handling of drug habitués was referred to the incoming Executive Co nmittee, with permission to bring it before the Royal Commission for consideration, if thought advisable.

The following motion, bearing upon the attitude which, in the judgement of the Council, should be assumed by the members of the college, in the matter of the carrying out of the provisions of the Ontario Temperance Act, was passed:

> "That, inasmuch as the government has imposed upon the medical profession the working out of the Ontario Temperance Act, according to Clause 51 of the Act, this Council desires to impress upon the profession at large the necessity of adhering to the Act with dignity and decorum, and that the registrar be instructed to provide the members of the college with a copy of the Clauses, and this resolution."

The Council adopted the report of the Special Committee appointed to consider the advisability of establishing a system of licensed midwives in Ontario. The report reads: "Conditions in the province at this time do not demand a system of licensed midwives."

The Council decided to request the Militia Council to provide that Canadian Army Medical Corps Officers should "have rank and compensation more in keeping with the services rendered."

The report of the Education Committee, as adopted by the Council, provides, *inter alia*,

1. That the question of unifor n matriculation standards be taken up, when the Canada Medical Council has issued its report on the same.

2. That the fifth year of the medical course shall be "wholly and exclusively academic."

3. That graduates in medicine of such foreign universities, as shall enjoy recognition under this College, will not be required hereafter to attend a full winter session of lectures and clinics in a Canadian medical College, before offering themselves for the college examinations.

4. The Council acceded to the request preferred by Queen's University and the University of Toronto, that the present summer session shall be regarded as a full, academic year, the College to hold its usual fall examination at the close of such session.

The same examiners, as had conducted the spring examinations, were reappointed.

A Special Committee was appointed, to act jointly with similar committees of the Ontario Medical Association and the Academy of Medicine, to approach the government, with a request for such amendments to the Workmen's Compensation Act, as would, in the operation of the same, provide for reasonable compensation for services rendered by members of the profession, in cases coming under the operation of the Act.

The Council adjourned on Friday, June 30th.

THE MEDICAL SOCIETY OF NOVA SCOTIA

The sixty-third annual meeting of the Medical Society of Nova Scotia took place on July 5th, 1916, at New Glasgow. Dr. Kennedy, of New Glasgow, was the president. It had been decided not to hold a meeting for the reading of papers on account of the disturbed conditions arising from the war; only a business meeting was held.

One paper, however, was read by Dr. A. P. Reid, now of Middleton; it dealt with his medical reminisences from the end of the fifties of last century down to the present time. These recollections were found to be most interesting.

The committee on the Copwell Library reported that the law-suit on the ownership of the library had been concluded. It had been decided that the library was the property of Dalhousie University which was to house it, but that the Society were trustees for the funds out of which the salary of a librarian and the purchase of books were to be met. The management of the library is to be the concern of a joint-committee on which the University and the Society are both represented.

The office bearers and various committees were appointed for the ensuing year. Professor Fraser Harris, of Dalhousie University, was elected president for 1916-17; and Dr. Sinclair Miller, of Stellarton, vice-president; Dr. J. R. Corston, of Halifax, secretary-treasurer. In the evening the members from a distance were entertained to dinner by the Pictou Medical Society. Dr. Kennedy was chairman; the Mayor of New Glasgow, Colonel Cantley, and representatives of the local press were also guests. Amongst other speakers at the dinner were: Captain (Dr.) W. H. Hattie, Department of Public Health, Halifax; Colonel Cantley of the Nova

Scotia Steel Works; Mayor Grant, of New Glasgow; Professor Fraser Harris; Dr. J. K. Macleod, of Sydney; and Dr. John Mackay, New Glasgow. A very pleasant evening was spent.

A telegram of greeting from his old friends in the Medical Society of Nova Scotia was despatched to Lieutenant-Colonel (Dr.) John Stewart, O.C. Dalhousie University (7th) Stationary Hospital now in France, a past-president of the Society.

SIMCOE COUNTY MEDICAL ASSOCIATION

THE fourth annual meeting of the Simcoe County Medical Association took place at Barrie, Ontario, on June 21st, Dr. C. A. Harvey, of Orillia, presiding. Some thirty-five members were in attendance and several interesting papers were read. The officers elected for the year 1916-17 are: president, Dr. Spohn, of Penetanguishene; first vice-president, Dr. F. C. Stevenson, of Bradford; second vice-president, Dr. J. Mackay, of Collingwood; third vice-president, Dr. C. S. Wainwright, of Orillia; secretary-treasurer, Dr. H. T. Arnall, of Barrie.

ALBERTA MEDICAL ASSOCIATION

THE annual meeting of the Alberta Medical Association will take place at the University of Alberta, Edmonton, on September 21st and 22nd, next, under the presidency of Dr. T. H. Whitelaw, of Edmonton.

PETERBOROUGH MEDICAL SOCIETY

AT the annual meeting of the Peterborough Medical Society, held on May 18th, the following officers were elected for the coming year: president, Dr. F. C. Neal; 1st vice-president, Dr. J. B. Mann; 2nd vice-president, Dr. N. H. Sutton; treasurer, Dr. N. D. Buchanan; secretary, Dr. E. A. Hammond.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. Murray MacLaren, C.M.G., St. John, N.B. President-elect—Dr. R. E. McKechnie, Vancouver. Secretary-treasurer—Dr. W. W. Francis, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. Herbert Bruce. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. W. A. Young.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. T. H. Whitelaw, Edmonton. Secretary—Dr. H. H. Moshier, Edmonton.

Annual Meeting, Edmonton, September 21st and 22nd, 1916

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett. A.M.C., Ottawa.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL SOCIETY:—President—Dr. J. L. Allen. Secretary—Dr. J. E. Aikenhead. Treasurer—Dr. W. Shipley.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Dr. J. G. Adami, Montreal. Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. N. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. C. J. Hastings, Toronto. Secretary—Dr. O. Withrow, Lumsden Building, Toronto.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr. H. V. Kent, Truro.

EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier, Building.

ELGIN COUNTY MEDICAL ASSOCIATION:—President—Dr. D. A. Cameron, Dutton, Ont. Secretary-treasurer—Dr. A. B. Riddell, Bayham, Ont.

FRASER VALLEY MEDICAL SOCIETY:—President—Dr. DeWolfe Smith. Secretary—Dr. D. F. Carswell.

HALDIMAND COUNTY MEDICAL ASSOCIATION:—President—Dr. Hopkins, Dunnville. Secretary—Dr. Courley, Cayuga, Ont.

HALIFAX MEDICAL ASSOCIATION:—President—Dr. K. A. McKenzie. Secretary—Dr. F. V. Wood.

HAMILTON MEDICAL ASSOCIATION:—President—Dr. John Y. Parry. Corresponding Secretary—Dr. P. D. MacFarlane. Recording Secretary—Dr. O. W. Niemier.

HURON MEDICAL ASSOCIATION:—President—Dr. Machell. Secretary—Dr. Hunter, Goderich, Ont.

KINGSTON MEDICAL AND SURGICAL SOCIETY:—President—Dr. W. G. Anglin. Secretary—Dr. W. T. Connell. Treasurer—Dr. G. W. Mylks.

LAMBTON COUNTY MEDICAL ASSOCIATION:—President—Dr. J. E. Kidd, Wyoming. Secretary-treasurer—Dr. A. R. McMillan, Sarnia.

LEEDS AND GRENVILLE MEDICAL SOCIETY:—President—Dr. J. C. Mitchell, Brockville. Secretary-treasurer—Dr. F. S. Vrooman, Brockville.

LONDON MEDICAL ASSOCIATION:—President—Dr. C. H. Reason, 538 Dundas Street. Secretary-treasurer—Dr. L. S. Holmes, 260 Hamilton Road.

LUNENBURG-QUEEN'S MEDICAL SOCIETY:—President—Dr. J. W. Smith. Liverpool. Secretary—Dr. L. T. W. Penney, Lunenburg.

MANITOBA MEDICAL ASSOCIATION:—President—Dr. James McKenty, Winnipeg. Secretary—Dr. A. T. Mathers, Winnipeg. Treasurer—Dr. T. Glen Hamilton, Winnipeg.

Medical Societies—*Continued*

MEDICAL OFFICERS OF HEALTH FOR COUNTIES OF LINCOLN AND WELLAND:—President—Dr. King, St. Catharines. Secretary-treasurer—Dr. Howell, Welland.

MEDICAL SOCIETY OF NOVA SCOTIA:—President—Professor Fraser Harris, Halifax. Secretary-treasurer—Dr. J. R. Corston, Halifax.

MEDICINE HAT MEDICAL SOCIETY:—President—Dr. W. H. Macdonald. Vice-President—Dr. C. E. Smyth. Secretary-treasurer—Dr. J. S. Macleod.

MONTREAL MEDICO-CHIRURGICAL SOCIETY:—President—Dr. F. A. L. Lockhart. Secretary—Dr. Grant Campbell.

MOOSE JAW MEDICAL SOCIETY:—President—Dr. J. M. Hourigan. Secretary-treasurer—Dr. J. Bloomer.

NEW BRUNSWICK MEDICAL SOCIETY:—President—Dr. W. W. White, St. John. Secretary—Dr. J. D. Lawson, St. Stephen. Treasurer—Dr. W. E. Gray, Milltown.

NIAGARA DISTRICT MEDICAL ASSOCIATION:—President—Dr. E. T. Kellam, Niagara Falls. Secretary—Dr. G. M. Davis, Welland.

ONTARIO MEDICAL ASSOCIATION:—President—Dr. A. Dalton Smith, Mitchell. Treasurer—Dr. J. H. Elliott, Toronto. Secretary—Dr. F. A. Clarkson.
Annual meeting. Toronto, 1917

OTTAWA MEDICAL SOCIETY:—President—Dr. Charles W. Gorrell. Secretary—Dr. A. MacLaren. Treasurer—Dr. Harold Alford.

OTTAWA MEDICO-CHIRURGICAL SOCIETY:—President—Dr. J. F. Argue. Secretary—Dr. R. K. Paterson. Treasurer—Dr. A. S. McElroy.

PERTH COUNTY MEDICAL ASSOCIATION:—President—Dr. C. F. Smith, St. Mary's. Secretary-treasurer—Dr. L. J. Sebert, Stratford.

PETERBORO MEDICAL ASSOCIATION:—President—Dr. F. C. Neal. Secretary—Dr. E. A. Hammond. Treasurer—Dr. N. D. Buchanan.

PICTOU COUNTY MEDICAL ASSOCIATION:—President—Dr. C. S. Elliott, Stellarton. Secretary—Dr. John Bell, New Glasgow.

PRINCE EDWARD ISLAND MEDICAL ASSOCIATION:—President—Dr. A. A. MacDonald. Secretary—Dr. W. J. MacMillan, Charlottetown.

REGINA MEDICAL SOCIETY:—President—Dr. Gorrell. Secretary—Dr. Dakin.

ST. JOHN MEDICAL SOCIETY:—President—Dr. D. Malcolm. Secretary—Dr. F. P. Dunlop.

ST. THOMAS MEDICAL ASSOCIATION:—President—Dr. Alexander Turner. Secretary-treasurer—Dr. James A. Campbell.

SASKATCHEWAN MEDICAL ASSOCIATION:—President—Dr. G. P. Bawden. Secretary—Dr. C. G. Sutherland, Moose Jaw.

SASKATOON MEDICAL ASSOCIATION:—President—Dr. T. W. Walker. Secretary—Dr. J. T. Mackay.

SIMCOE COUNTY MEDICAL ASSOCIATION:—President—Dr. Spohn, Penetanguishene. Secretary-treasurer—Dr. H. T. Arnall, Barrie.

SWIFT CURRENT DISTRICT MEDICAL ASSOCIATION:—President—Dr. Graham. Secretary-treasurer—Dr. Hughes.

THUNDER BAY MEDICAL SOCIETY:—President—Dr. E. B. Oliver, Fort William. Secretary-treasurer—Dr. J. G. Hunt, Port Arthur.

TWIN CITY MEDICAL ASSOCIATION:—President—Dr. W. L. Hilliard. Secretary—Dr. J. E. Hett, Berlin, Ont. Assistant Secretary—Dr. G. E. Chapman.

VALLEY MEDICAL SOCIETY:—President—Dr. M. E. Armstrong, Bridgetown. Secretary—Dr. T. M. MacKinnon, Berwick, N.S.

VANCOUVER MEDICAL ASSOCIATION:—President—Dr. J. H. McDermott. Secretary—Dr. J. W. Ford. Annual meeting, April, 1917.

WEST ELGIN MEDICAL SOCIETY:—President—Dr. Crane, Wallacetown. Vice-President—Dr. Webster, West Lorne. Secretary-treasurer—Dr. Smith, Fingal.

WINNIPEG MEDICAL SOCIETY:—President—Dr. Jasper Halpenny. Secretary—Dr. Secord.